Network

Railways of Australia
Quarterly June, July, August 1982
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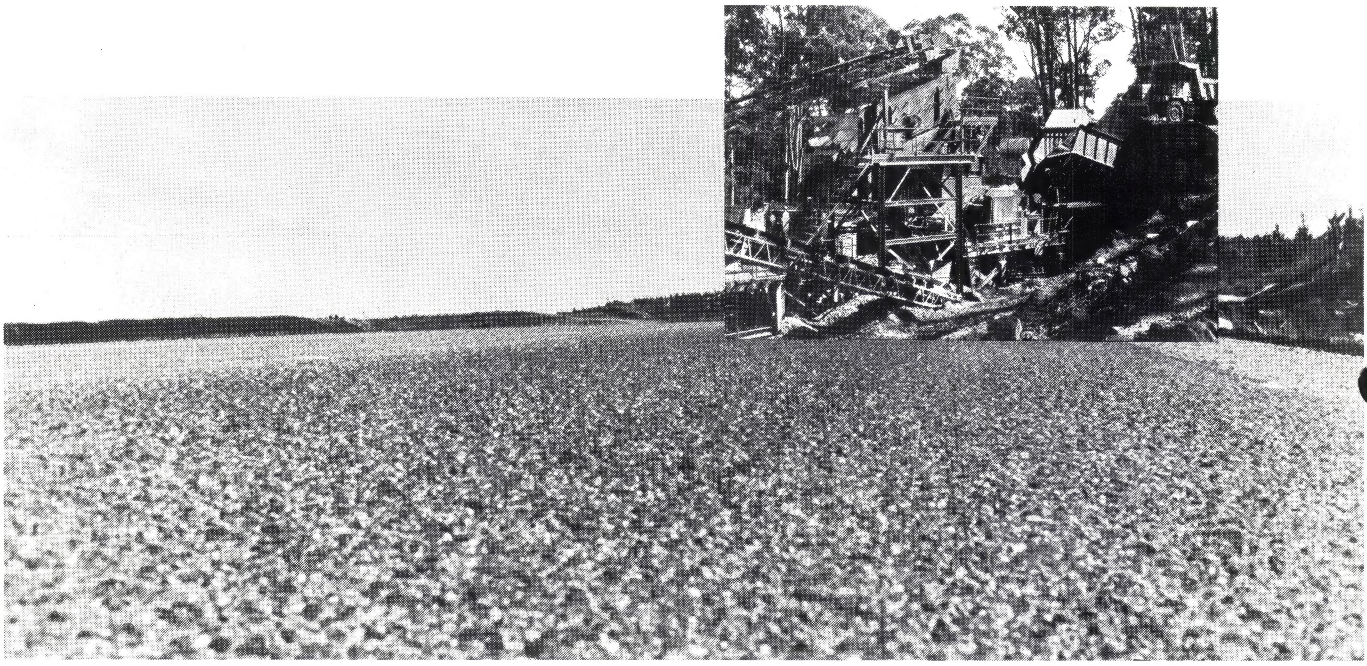
Urban transport . . . first in a series (page 9)
'Get into training' says AN (page 17)
Passenger increase (page 38)
Development of XPT bogies (page 51)
Rocket lands in Victoria (page 60)

It snowed, it rained in near record falls... and still the deadline was met.



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Network

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Front cover:

Development work on VicRail's suburban network is proceeding on schedule. This attractive photograph was taken a few minutes before dusk.

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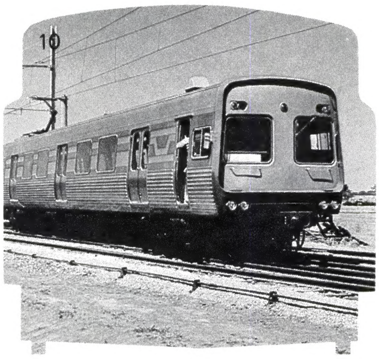
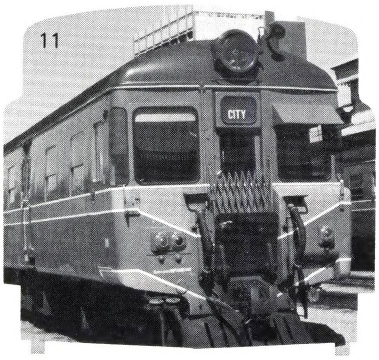
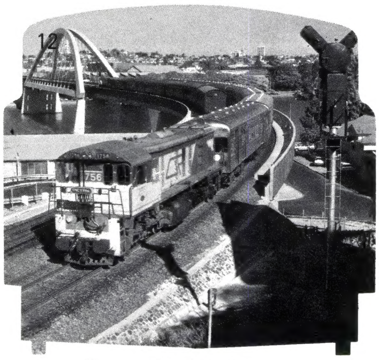
Australian National



VicRail



Westrail



Queensland Railways

State Rail Authority of NSW

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Our only requirement of writers and personalities who contribute to Network is that they be informative or entertaining and that their subject has relevance to the wide interests of railwaymen today. Naturally, there will be occasions when their viewpoints or opinions run contrary to those of the editor or to Railways of Australia. We must accept that these differences are among the elements essential to the presentation of a lively and interesting magazine.

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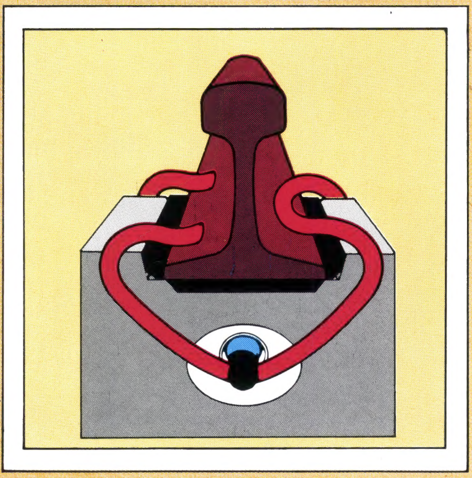

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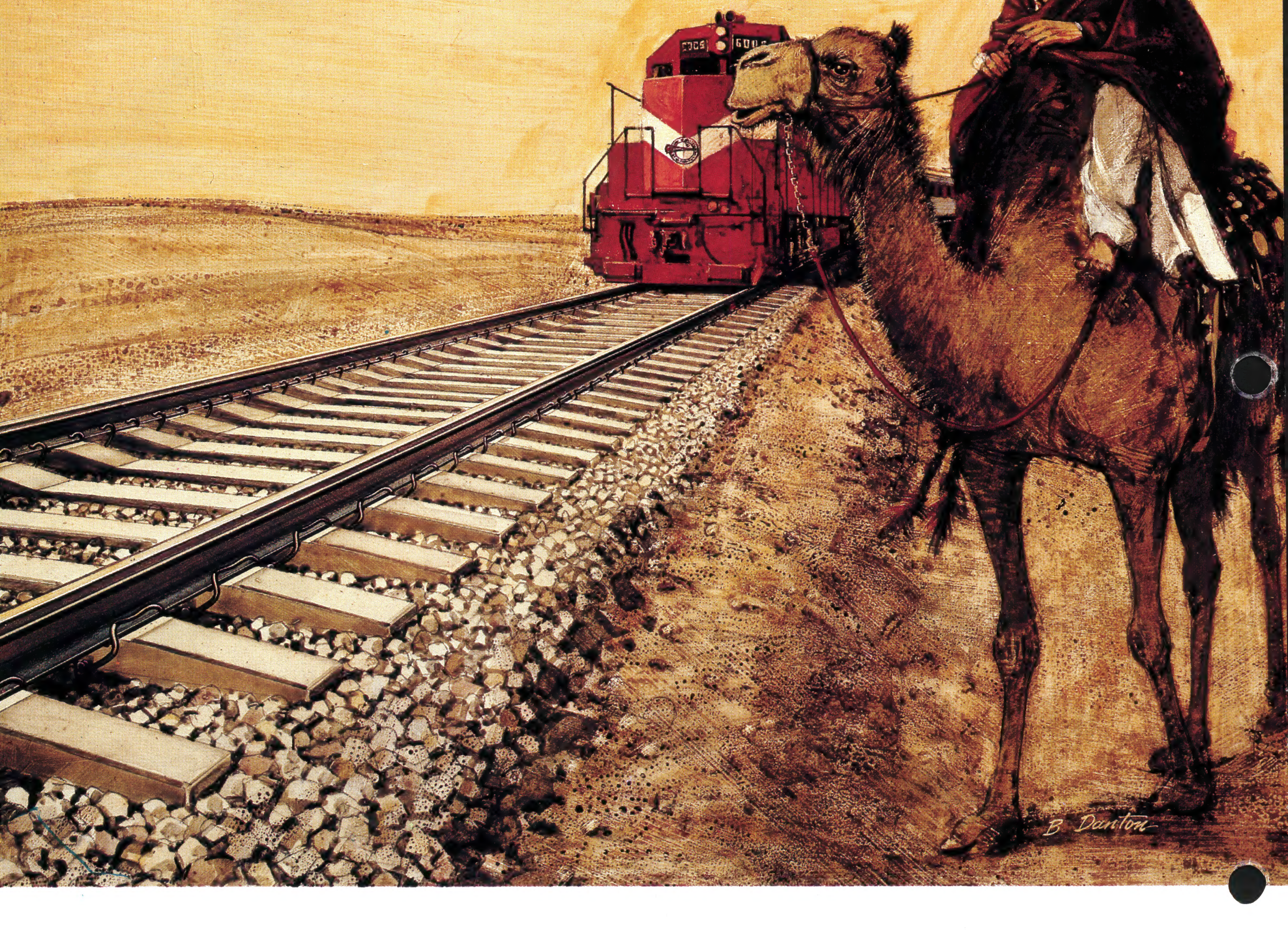

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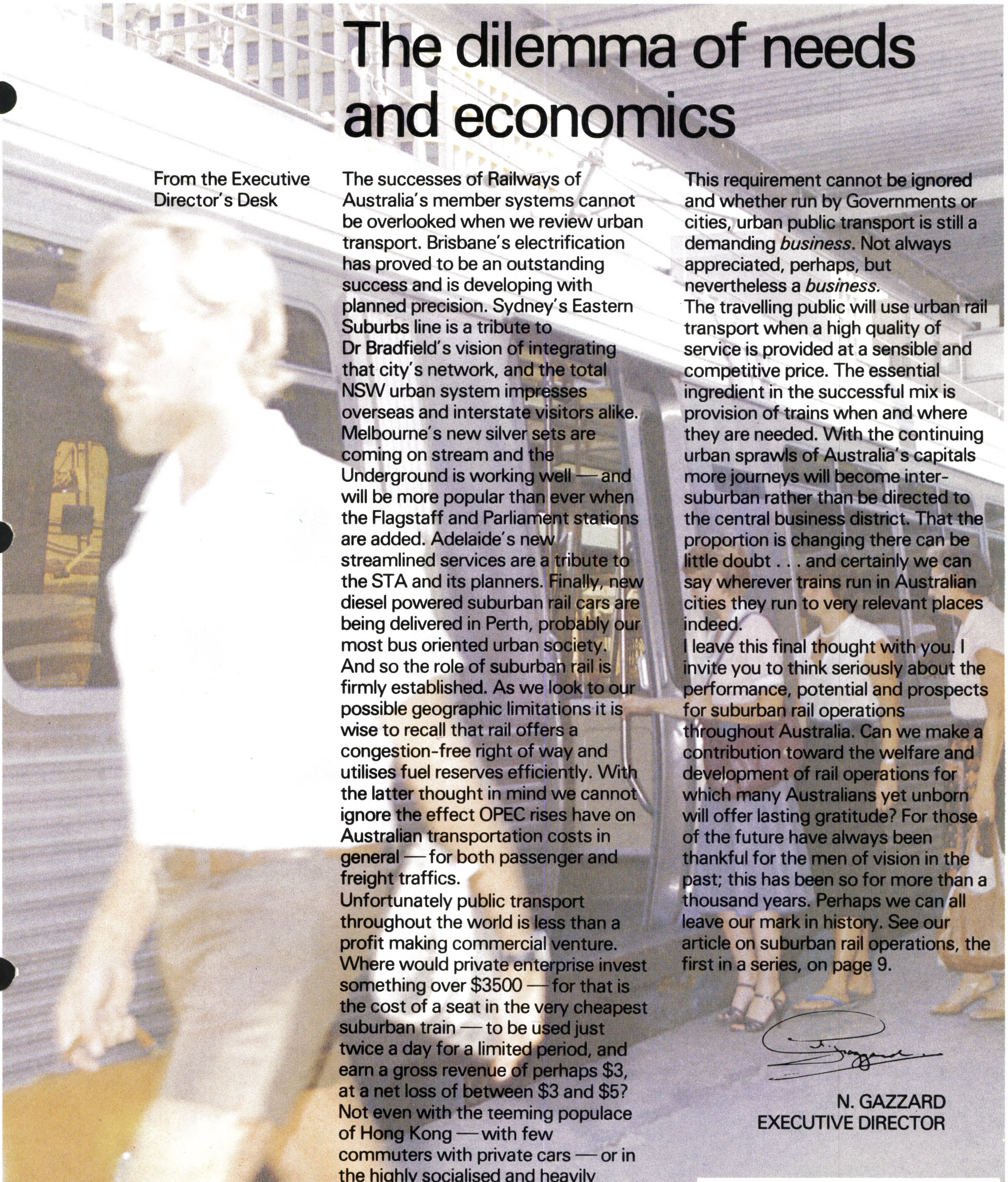


The dilemma of needs and economics

From the Executive Director's Desk

The successes of Railways of Australia's member systems cannot be overlooked when we review urban transport. Brisbane's electrification has proved to be an outstanding success and is developing with planned precision. Sydney's Eastern Suburbs line is a tribute to Dr Bradfield's vision of integrating that city's network, and the total NSW urban system impresses overseas and interstate visitors alike. Melbourne's new silver sets are coming on stream and the Underground is working well — and will be more popular than ever when the Flagstaff and Parliament stations are added. Adelaide's new streamlined services are a tribute to the STA and its planners. Finally, new diesel powered suburban rail cars are being delivered in Perth, probably our most bus oriented urban society.

And so the role of suburban rail is firmly established. As we look to our possible geographic limitations it is wise to recall that rail offers a congestion-free right of way and utilises fuel reserves efficiently. With the latter thought in mind we cannot ignore the effect OPEC rises have on Australian transportation costs in general — for both passenger and freight traffics.

Unfortunately public transport throughout the world is less than a profit making commercial venture. Where would private enterprise invest something over $3500 — for that is the cost of a seat in the very cheapest suburban train — to be used just twice a day for a limited period, and earn a gross revenue of perhaps $3, at a net loss of between $3 and $5? Not even with the teeming populace of Hong Kong — with few commuters with private cars — or in the highly socialised and heavily populated city of Moscow, can urban transport be run at a profit. But what urban rail systems do most successfully is move vast numbers of people at a lower net cost than any other possible mode.

However this premise does not encompass a divine right to operators of railway systems to provide less than adequately for the travelling public. People are individuals with hopes, problems, feelings and needs, and they share an aspiration for greater urban mobility. This requirement cannot be ignored and whether run by Governments or cities, urban public transport is still a demanding *business*. Not always appreciated, perhaps, but nevertheless a *business*.

The travelling public will use urban rail transport when a high quality of service is provided at a sensible and competitive price. The essential ingredient in the successful mix is provision of trains when and where they are needed. With the continuing urban sprawls of Australia's capitals more journeys will become inter-suburban rather than be directed to the central business district. That the proportion is changing there can be little doubt . . . and certainly we can say wherever trains run in Australian cities they run to very relevant places indeed.

I leave this final thought with you. I invite you to think seriously about the performance, potential and prospects for suburban rail operations throughout Australia. Can we make a contribution toward the welfare and development of rail operations for which many Australians yet unborn will offer lasting gratitude? For those of the future have always been thankful for the men of vision in the past; this has been so for more than a thousand years. Perhaps we can all leave our mark in history. See our article on suburban rail operations, the first in a series, on page 9.

N. GAZZARD
EXECUTIVE DIRECTOR

Multi-modal transport: a revolution in distribution

As a fine example of what Network believes is an excellent and enlightened comment on Australian transport, we herewith reprint an address by Mr Lou Marks, Chairman of Australian National, to the Volvo Seminar held in Sydney in April of this year.

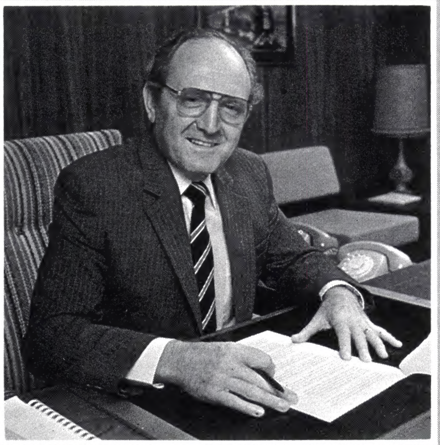
It has been my honour to be invited to speak at a number of industry, government and trade gatherings but this is the first occasion on which I've been asked to participate in a seminar organised and funded by a private enterprise corporation.

The transport industry doesn't often encounter such a positive unselfish contribution to its education process and so may I commence my segment of this seminar by offering my congratulations to the managing director of Volvo Australia, Mr Jan Waldorf, and through him to his fine company for their enterprise and generosity.

As far back as I can recall, when I was just a lad starting my career in transport, it seemed to me that meetings of transport people were confined to particular modes and their parochial interests — they were held pretty much in camera and again from my observations only the high and mighty were invited to attend.

Today industry meetings and conferences have become far more open forums, their deliberations now cover a wealth of associated interests and they are certainly held at more frequent intervals.

I believe that this change in pattern has been influenced by the multitude of fairly dramatic events that have occurred over more recent years, events that have contributed not only to the land transport industry gaining greater notoriety but which have in turn generated an awareness by the participants in the transport game of the need for communication not only within a sector of the industry but indeed between the various modal interests.



Mr Lou Marks

There was of course that particular incident which helped generate the type of climate for change to which I refer, and whilst I don't applaud nor condone all that took place in the road sector in April 1979 I do however suggest that Greendog and his associates throughout Australia, not only shook the regulatory process until some well overdue reforms were forthcoming, they also created more interest in the total transport industry which in turn recognised the need for greater dialogue than we had ever experienced before.

The one further observation that I feel should be made relative to industry gatherings is that there is little sense in participating if you are plagued with the dreaded complaint of tunnel vision.

If you can't accept that there could be merit in other than your own particular mode or through a combination of modes and you can't bring yourself in this instance to agree with the philosophy underlying a phrase that I use almost every time I write or speak on the subject, then you're as parochial in your outlook today as were our predecessors some thirty to forty years ago.

The phrase is simple, it is that I believe each of the transport modes — road, rail, sea and air — should play the role for which they are technically, economically and socially suited.
I don't believe that the various transport modes are necessarily mutually destructive, and perhaps because I'm somewhat of a transport dreamer I consider they are all supplementary segments of a nation's transport system.

I'll concede that perfection is hard to find this side of heaven and hence that beaut statement might well remain a most desirable but unachievable goal, however, there are still those areas of transport activity where a combination of modes could well achieve a far more favourable result than might be available to the parochial operator.

What I'm saying is that in the world of the would-be dedicated road transport operator, the long time one-eyed railway man and even the salt encrusted master mariner turned transport manager, there can be merit in a meeting of the modes, in other words a multi-modal transport system.

All of which brings me back to where I came in, for when they invited me to present a paper today our hosts suggested that the title be "Multimodal Transport — the revolution in the distribution industry", and as I have made a practice when accepting such invitations of staying with my hosts choice of title then multi-modal transport it will be.

Now having at some time or other been involved with each of the modes I felt certain I could handle the multi-modal segment — but what of the revolution — this surely required analysis and so to my well thumbed dictionary which informed me that the word meant:

(a) A complete change by an object or a figure,

(b) A complete change in outlook,

(c) A radical change in government.

I felt that the "complete change by an object or figure" would probably explain my own position when a little over twelve months ago I accepted my present appointment with the Australian National Railways Commission — but I leave it to your own judgement as to whether I have become the object or the figure.

As to the "complete change of outlook" I am not too certain that we really contemplate such a radical change when we consider multi-modal transport, after all, it has been with us for years, we just didn't have a trendy name for it until more recent times.

As I said earlier, over the years there have been many causes for change both in operational areas as well as in the makeup of industry seminars, what I'd like to do now is explore the ansport scene and perhaps pick out ome of the more dramatic changes that have taken place.

I have no doubt that you would be well aware of particular events — but bear with me as I put them into some form of chronological order.

You see whenever I think of transport, I can't help but bring to mind that which I call the landmarks or highlights in Australia's land transport history particularly since the Second World War, each of which has served to influence the total domestic transport pattern.

The first of my so-called highlights occurred in 1948 when employees of the Victorian Government Railways took strike action that was to last for pproximately eight weeks.

Until that event interstate road transport with the exception of a few furniture vans was almost non-existent in Australia — coastal shipping carried the lion's share of the interstate traffic with rail enjoying a quite substantial volume of the trade but hampered by the mistakes of our forefathers through the service destroying variation in rail gauges between States, particularly on the volume-rich Melbourne-Sydney corridor.

Each of the States had their own rail system and each of them had in the 1930's enacted legislation in the form of transport co-ordination acts to protect their State interests from possible attack from the slowly nerging road transport industry.

In 1948 however, railways were operating with rollingstock and permanent way that had been overworked, undermaintained and starved for finance throughout the war years, morale was low, service standards were down, so that the industrial action coming on top of this pitiful scenario had, in my opinion the effect of advancing the road transport cause by at least eight to ten years. Nevertheless, possibly the most historically significant of our highlights was associated with road transport and has come to be known in this country as the famous or infamous Hughes and Vale case.

This landmark as you well know was a legal struggle that went through our Australian Courts and finally went before the Privy Council in 1954 when a small interstate road transport company owned by a Mr Hughes and a Mr Vale challenged the legality of road taxes imposed on interstate transport by the State of New South Wales.

Hughes and Vale won the case when the Privy Council upheld section 92 of the Australian Constitution which in part states that trade between the States shall be absolutely free.
The Dropping of road tax as each of the States was forced to do opened the flood gates of change and road transport made rapid inroads into the interstate freight and passenger markets.

Then came January 2nd, 1962 and the first standard gauge freight train to run between the Alexandria Goods Yards in Sydney to Dynon in Victoria — at long last the rail system appeared to be getting its act together.

This long awaited standard gauge line between Australia's two major capitals brought forward dramatic media headings such as that of the Sydney Morning Herald of Tuesday, January 2nd, 1962, which proclaimed "road, rail happily married" — one could have added "for about as long and as happy as Elizabeth Taylor and her husbands one to six".

The freight forwarders and road transport operators of the day when asked by the Sydney Morning Herald what they considered would be the outcome of the railway initiatives made such predictions as:

- Now at long last we are begining to see the light. No argument need exist — the answer is road plus rail.
- A marked reduction in the tonnage of general goods now being carried on road.
- Any damage which may have occurred in transhipment at the border will completely disappear.
- Clean competition has always proved a stimulus to progress and this new era of transport should prove that fact.
- We believe the effects will be rapidly apparent.

Well what became rapidly apparent was that everything was different but nothing had changed — true, more traffic was directed to rail but even today road transport enjoys the larger share of the available intercapital freight business.

In 1968 South Australia deregulated road transport and allowed open competition between the modes, 1974 New South Wales followed suit while in 1977 Queensland abandoned its transport co-ordination tax on road vehicles and allowed that mode to compete for the transport of most commodities on most routes — these dates were for very obvious reasons further highlights in our nation's transport history.

The standard gauge connection in 1970 between Sydney and Perth was another undoubted highlight — though perhaps not as influential in the national pattern as those already nominated.

In 1979 we experienced the highlight to end all highlights, the Razorback Incident, when the owner-driver segment of the Road Transport Industry blockaded firstly the Hume Highway just south of Sydney and then progressively each of the major arteries throughout the nation.

Rail yards were picketed so that little or no cargo was moved by the only viable alternative — Australia was under a form of siege.

The claims of the operators were numerous but simple:

- Eliminate road maintenance tax.

(continued on page 47)

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People per hour

This article by a special correspondent is the first in a series dealing with urban transport systems. Our writer examines Australia's performance against many overseas systems in handling the perennial problem of peak period passenger movement.

Australians are the most urbanised people in the world, which ought to be good news for urban railways.

But Melbourne, for example, is also the most motorised city in the world, and for public transport that is surely bad news.

Our three-bedroom detached lifestyle and consequent low density of suburban population make the job of providing Australians with adequate public transport an expensive business. This especially applies in the case of suburban rail transport, with its 1½ km walking radius catchment area, its more expensive vehicles, and its classic primary role of mass transit to work during the peak hours. Moving the peak typically calls for between three and five times the volume of rolling stock needed to work a marketable service between the peaks — and it all has to be purchased, staffed, stabled, cleaned and maintained.

At the opposite end of the quarter-acre-block density spectrum there are, in our wonderful cities, great numbers of people who want to be moved about, but precious little space to implant the transport system needed to carry them. Space is, of course, required for the terminals, vehicle-parks, and repair depots of any people-moving system. But in downtown areas the most critical space of all is that needed for the 'way' itself: the lane along which people are moved and at designated places, loaded or unloaded into the vehicles.

After acceptable safety and cost, the three main indices of system performance are the 'commercial' or stops-included average speed, the standard of comfort (or discomfort) and the number of people per hour.

Other modes. Be it a standard 3.7 m road lane for cars or buses, a reserved-track tram line, or the space needed for an electric railway track, the usual width of an urban transport 'lane' is just under four metres.

We can, of course, always walk. With a freely-moving one-way stream of pedestrians, the nominal 3.7 m road lane will clear about fifteen thousand people walking at 5 km/h, every hour. Delays at barriers, gates, road crossings etc. can cut this to a half or a third of the unobstructed theoretical flow, and and uncontrolled two-way melee reduces it even more.

Escalators and moving footways are far more efficient than walking up steps from one level to another, and are also substantially faster. In Europe the 'Trax' high-speed people-conveyor will match pedestrian flow per equivalent lane width, board at 3 km/h, and raise the travel speed much higher, moving 9 000 people/h each way at 12 km/h in a 4.7 m two-directions right-of-way. But a very high maintenance penalty is paid in the 'way' of all mechanical pavement systems.

Bicycles can achieve about 4 000 people/h at about 8 km/h in our one-way lane but, as the Irish philosopher once asked, how and where could you find 4 000 athletic commuters to fill the bikeway? Doubtless cycling enthusiasts will write to us en masse and reply.

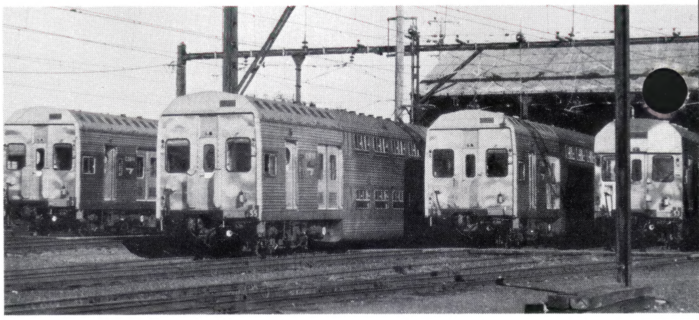
We can do far better on two feet or two wheels than sitting on our bottoms in motor cars. The theoretical maximum flow of an unobstructed freeway lane is 2 000 vehicles/h (vph) at around 30-35 km/h, and in most Western cities the average peak-hour occupancy is only 1.2 people per car. As 1 500 vph is more common when allowance is made for a mixed flow of traffic, the typical maximum throughput for cars in urban freeway conditions is about 1 800 people/h. On a city street it is far less, and intersections and traffic lights will often reduce it to under 1 000 people/h.

Taxis improve on these figures since their average 'effective' occupany is higher; this is the usual rationale for admitting them to bus and transit lanes. Mini-buses would probably attain 4 500 people/h and the Jeepneys used in Asia and South America perhaps 6 000 people/h, traffic light slowups included. In passing, these 'para-transit' options represent a very effective use of petrol, as distinct from diesel bus fuel, to move people.

Diesel buses or electric trolleybuses, operating in reserved bus lanes with off-lane loading platforms and

URB

VicRail's new airconditioned suburban cars are produced by Comeng in Victoria. They are replacing units in service for half a century.



Sydney's double decker suburban cars have provided an apt solution to peak traffic problems for the S.R.A. of N.S.W.

acceleration/deceleration lanes, have attained up to 300 vehicles/h for short periods. This suggests a theoretical maximum of about 15 000 people per hour for non-articulated buses. But in city traffic, where the lane is also a loading lane and where traffic lights interrupt the flow, the French busway-planning figures of 120 buses or 6 000 people/h, at commercial speeds of 10-12 km/h, are more reasonable expectations.

Network knows of no Australian city street — no, not even Pitt and Castlereagh Streets in Sydney — that sustains this bus flow rate through a full peak hour, although streams of vehicles clearing sporting fixtures will approach it for shorter periods. And all of the internal-combustion-engined road options involve a pretty horrendous price in air pollution.

Trams. Electric trams have attained far greater hourly densities, both in terms of vehicles and people. The densest tram service ever seen in Australia is believed to have been that in Pitt and Castlereagh Streets, Sydney, before the City Railway and the Harbour Bridge were opened in 1932. The intensive city-distributor (Circular Quay to Railway Colonnade) and suburban services are believed to have aggregated no less than four trams per minute in peak periods. Most of them were bogie cross-bench (footboard) cars, including many paired cars offering 160 seats and 80 standee places per coupled set. No street vehicle has yet been devised that was more efficient at moving people, and it is likely that peak flows of 25 000 people/h were routinely sustained on these one-way Sydney routes before the motor car came, and the motoring organisations complained of 'road congestion created by the trams'.

This capacity claim is supported by the known performance of the same trams in clearing race and show crowds over reserved-track tramway routes in the 1950s. As old photos confirm, travelling conditions were pretty grim. With modern corridor trams which load slower, seat fewer, but kill fewer conductors, figures of 10 000 people/h would apply for single cars and 18 000/h for European-style articulated cars. Certainly there is much truth in Grandpa's claim that the trams could shift people far more efficiently than today's buses can.

The highest-density tram-like operation known was on the old Chicago Elevated Railway, or El, before the opening of that city's first subway system during World War II. A clue to El capacity is given from the often-quoted figure of 224 trains per hour, of up to six cars, across the Lake and Wells Street junction at the NW corner of the Loop District. As the tracks opened out to two parallel one-way routes around the Loop itself, the number of train movements would, after allowing for other El and interurban trolley lines feeding-in to the southern end of the Loop, be something over 60 trains per track an hour. Each train would have averaged five cars, with 80 people per car, suggesting a maximum performance around 24 000 people/h. Headways on the El depend on the motorman's judgement on straight track, with simple colour light signals to protect blind corners: at the key crossing the tracks single, and the trains were funnelled across by signal in platoons to maximise junction capacity. Lake and Wells Streets was claimed to be the busiest rail junction anywhere in the world and during rush hours, the noise from 4 500 axles banging over the right-angle crossing on the elevated steel structure must have been indescribable. It is bad enough even today. The El system was, nonetheless, just as effective a people-mover as Sydney's trams and having its own 'way', was considerably faster. It also had a remarkably good safety record.

Electric railway capacity. The best crowd-shifters of all are electric trains, often referred to as 'heavy rail' in contrast to 'light rail' i.e. trams. But there is a tremendous range in capacity according to the kind of 'heavy' railway (metro-subway or suburban), the infrastructure, car and train size, and the operating conditions. Thus many allegedly busy double-track suburban railways fail to move people at the capacity of a modern tramway, while some overseas railways move people at almost three times the capacity of Australia's busiest underground 'heavy' rail route.

It will be fairly obvious that the maximum capacity of an electric railway line is attained when multiple-unit trains (i.e. self-propelled cars) are made up of:

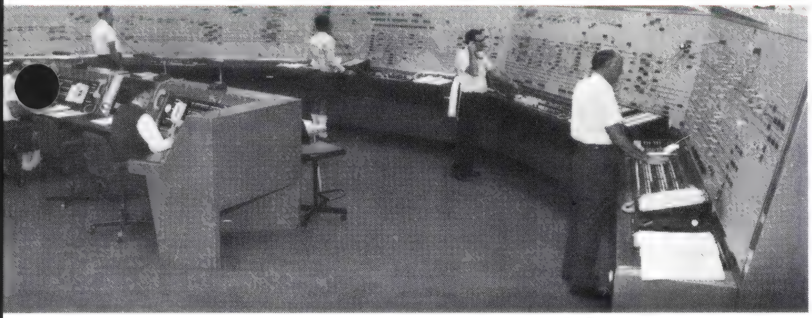
- the maximum number
- of the longest, and
- the widest possible cars. These are cars with
- the maximum number of doors, and
- the minimum seats-to-standees ratio, thus maximising passengers.

In order to maximise throughput, such trains are operated

- either non-stop, or stopping only at platforms clear of running lines, and
- at the closest practical headways.

As this seven-point combination is a rather formidable concept to grasp in one bite, let's examine it in steps and then put them all together.

Electric trains tend to be 'multiples' of two-, three-, or four-car 'units'. The longest suburban trains in the world are believed to run on the Long Island Railroad in New York, which routinely operates 12-car sets. The LIRR trains carry about 1 500 people, mostly seated. The French National Railways plan to run 12-car trains over the Paris Interconnection and the South African Railways also operate 12-car trains into native townships; all these trains will lift over 3 000 people but not very comfortably. No system is known to run 11-car trains, but the Soviet Railways and British Rail (Southern Region) routinely operate 10-car suburbans. On subway lines, some New York City lines, the Hong Kong metro and the BART subway in San Francisco, are platformed for 10-car trains. Nine-car and eight-car sets are found on many systems around the world. The nine-car suburbans into Bombay's Churchgate and Victoria



The electronic era has had a profound influence on control and monitoring systems. This scene is in Metrol in Melbourne.

Perth's suburban network is undergoing rapid upgrading. New diesel railcars are produced by Goninon's in N.S.W. and completed in Western Australia.

Termini routinely lift up to 3 600 per train. The longest Australian suburban trains are the traditional eight-car sets in Sydney, and the occasional eight-car Harris (blue) trains operated in Melbourne. The London tubes run six- or seven-car trains; the Paris urban metro operates five-car trains.

The longest suburban carriages run in the world are believed to be the 26 m vehicles found on several US commuter railways. The longest metro cars are the 24.4 m Hong Kong subway cars: several North American subways run 23 m cars.

The longest Australian electric cars are Melbourne's 'silver' and 'orange' trains, and Brisbane's new 25kV AC trains, all with 22.8 m cars. Adelaide's new Jumbo diesel cars are, however, longer at 26 m.

The world's widest cars are found on the Bombay and Calcutta suburban lines: 3.95 m bodies on the world's widest track gauge of 1 676 mm. The largest wide-car fleet in Australia comprised the old one-deck (1927, 1949, 1955 series) steel cars in Sydney at 3.2 m; the new two-deckers are just a shade narrower for platform clearance reasons but still seat five across. Next widest are the Adelaide Jumbo diesels. Both one-deck fleets will eventually be eclipsed in numbers, but not in width, by Melbourne's latest 'orange' electric cars (300 on order).

The largest number of door openings found on each side of modern saloon-type stock is five, but four is more common on metros. Sydney used to use four-door wooden electric cars; today, three-door stock is the standard in Melbourne and two-door stock in Sydney and Brisbane, where curves are more severe and mid-car platform gaps cause problems. Non-corridor (dogbox) stock has been built with up to 12 swing doors per car (India) and 11 (UK). The old red Tait trains in Melbourne are semi-corridor cars with nine sliding side doors, and Brisbane's old red trains (Evans cars) have eight swing doors. All of these loaded faster than modern stock with safety doors, and lacking corridors, seated more than modern stock.

The car with the minimum number of seats is the short four-door subway type with longitudinal benches along the wall and maximum standee space. Happily for commuters, Australia has no such cars. The Indian suburban cars seat six across, (seven across at the compartment ends!) but the stock with the greatest number of seats is believed to be two-deck electric loco-hauled suburban stock running into three dead-end Paris termini (Nord, Est, St. Lazare). The cars are five across and 24.3 m long, and the basic mid-train vehicle seats 175 in good comfort. Yet it still finds space for 121 standees and a toilet!

Purists would say these cars are more 'interurban' than 'suburban' in nature and would point to one-deck, 126-seat commuter cars in the USA, or to the shorter 128-seat two-deck suburban trailer cars run in Sydney. But whatever the definition, the French stock still lifts the most people in terms of seats, and the departure platforms are clearly labelled Banlieue, which means suburban.

In considering headways, it is important to distinguish between the minimum headway for which the signal system is designed, and the headway which is attained in traffic, after due allowance has been made for all those inconvenient humans that clag up the perfect system while loading themselves on and off the trains.

The main Interconnection link of the new Reseau Express Regional (RER) in Paris is signalled for 60 sec headway between the Gare de Lyon and Chatelet: 60 trains/h. It will actually operate 40 trains/h at 90 sec headways: this is believed to be the world's highest practical train density for a properly-signalled railway. Extra berthing tracks are provided on this critical RER section to keep halted trains clear of the next arriving train.

On more conventional railways, where all trains stop on the running line to load or unload their passengers, Paris, Moscow, and London vie for the laurels. In Paris, the shortest known signal-system headway on the urban Metro is 45 sec, and the shortest practical headway is 105 sec; both are attained on the rubber-tyred Lines 1, 4 and 6. To achieve this trains are short (five cars) and automatically driven.

Loading time is controlled by the sounding of door buzzers, after which it is an offence to enter or leave a car. Trains run to headways, and not to a timetable as such; Line One routinely achieved 34 trains hourly until the RER was built, easing the load. The Moscow underground is believed to achieve 30 trains/h, on steel wheels and with longer trains.

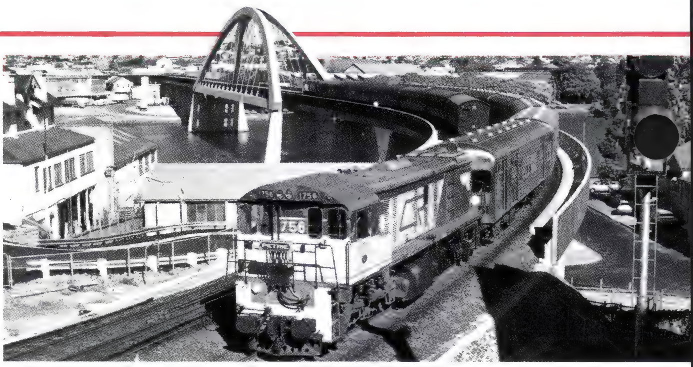
But the Parisian steel-wheeled lines match this and also turn their trains around on one-road dead-ends, at the same unbroken beat of 30 trains/h, albeit with hand-picked staff and terminal relay crews. Points are manual and antique 1927 stock is often involved. Traffic through King's Cross on the northern side of London's Circle Line (where tracks are shared with the Metropolitan Line) and at Charing Cross (shared with the District) is worked at 32-36 trains/h. On the Southern Region, one track works 29 trains/h through London Bridge. The New York subway passes, loads and turns around 28 trains/h.

The Sydney City Railway is signalled for 90 sec headway. Trains routinely run alternate two and three minute timings (24 trains/h) in Sydney, and for short periods, in Melbourne and Brisbane at the same rate.

While still on 'highs' and 'lows', the longest trips routinely scheduled for suburban trains are again believed to be Indian, where the Central Railway's wide electrics run from Bombay Victoria Terminus to Karjat at the foothills of the Ghats, just 100 km. The stock is occasionally run up the hill to Pune (Poona) 195 km. The cross-town journey in Sydney from Cowan to Penrith via the Harbour Bridge, 96 km, is Australia's longest suburban trip and a close runner-up to India.

The most complex and extensive suburban network in the world is that of the Southern Region of British Rail,

South Australia's State Transport Authority 'Supertrains'.



Brisbane's electrification programme is proceeding apace. The new Queenslan Railways suburban cars are extremely comfortable — all are airconditioned. Br bane's Merivale Bridge provided the essential new north/south connection.

where suburban and interurban services operate into Waterloo (21 platforms), Victoria (17), London Bridge (15 terminal plus 6 through platforms), Charing Cross (6 platforms), Cannon Street (8), Blackfriars (3) and Holborn Viaduct (4), giving SR a total of 80 city platforms. The most complex network in Australia is probably Sydney's, where the station complex of Sydney Terminal/Central/Underground has 25 platforms. Melbourne's network will approach this complexity when the new Loop is fully operational, although in operational terms the Loop's lines will be more separated than in Sydney.

The highest suburban electrification voltage is the nominal 25 000 (25kV) AC used in many overseas countries and in Brisbane, where the system is designed to cope with peaks of 27.5kV (the Russians talk about their '27.5kV' system). The lowest nominal voltage is the 600 V DC of several underground three-rail systems, and of the four-rail London Underground whose conductor rails are plus 150 and minus 450 volts from the running rails; the system has been known to keep going, under crisis conditions, with as little as 350 volts across the conductor rails and a dim red glow in the light bulbs. The Sydney and Melbourne systems are 1 500 V DC; Sydney's trains are designed to work in the range between 2 000 and 900 volts.

The fastest suburban trains in the world are probably the Budd Silverliner and similar GE-built commuter trains in Philadelphia, which are geared for and attain 145 km/h. Some British electric trains match this, but are described as 'outer suburban' and would thus be considered 'interurbans' in Australia. Sydney's new electric trains are safety-tested at up to 135 km/h, but they rarely operate at over 105 km/h. If VicRail eventually operates its new suburban stock on an electrified Geelong line, it is likely routinely to reach 120 km/h. The fastest commercial (stops included) speed of a cross-town urban railway is the 50 km/h achieved by the RER in Paris. Their cars are geared for 105 km/h, and often attain this speed in at least one of the long inter-station tunnel sections under the city.

The fastest booked suburban service in Australia is still believed to be — wait for it — Midland to Perth non-stop, on the narrow gauge and with diesel traction.

Maximum flow rates. When all these factors are put together into a system able to sustain day-to-day peak flow rates, we find that in India, flows of 20 suburban trains/h, each loading around 3 600 people are achieved into Bombay Churchgate, a rate around 70 000/h. Nobody else matches this, but in Hong Kong, 30 trains/h loading 3 000/train are designed for; of this planned 90 000 people per hour, probably 60 to 65 thousand will routinely be achieved.

The busier subway lines in New York City (e.g. 7th Avenue) offer 45 000/h and routinely achieve 35 000/h. These lines are far busier than the London Underground or the Paris urban metros, and about the same as Tokyo. On the Southern Region of British Rail, 29 trains loading up to 1 500 per train are operated hourly, a nominal 43 500 and a practical 40 000/h or so on the busiest track. On the RER in Paris, the planned Interconnection service of 40 trains per hour with up to 2 200 per train will offer maxima of 88 000 places per hour. However, mindful of its patrons' comfort, the Paris RATP neither plans nor expects to load its system at anything like this level and probably some 60 000 people/h will be achieved — the most achieved anywhere under western travelling conditions.

Medium Australian systems.
Fortunately for the comfort of the Australian commuter, our loadings do not even remotely approach these figures: all our systems are in basic character suburban railways and not metros, even though they have collection/distribution functions across the central city area. It could be argued that the City and Eastern Suburb Railways in Sydney are now fulfilling a true metro role, and are thus exceptions.

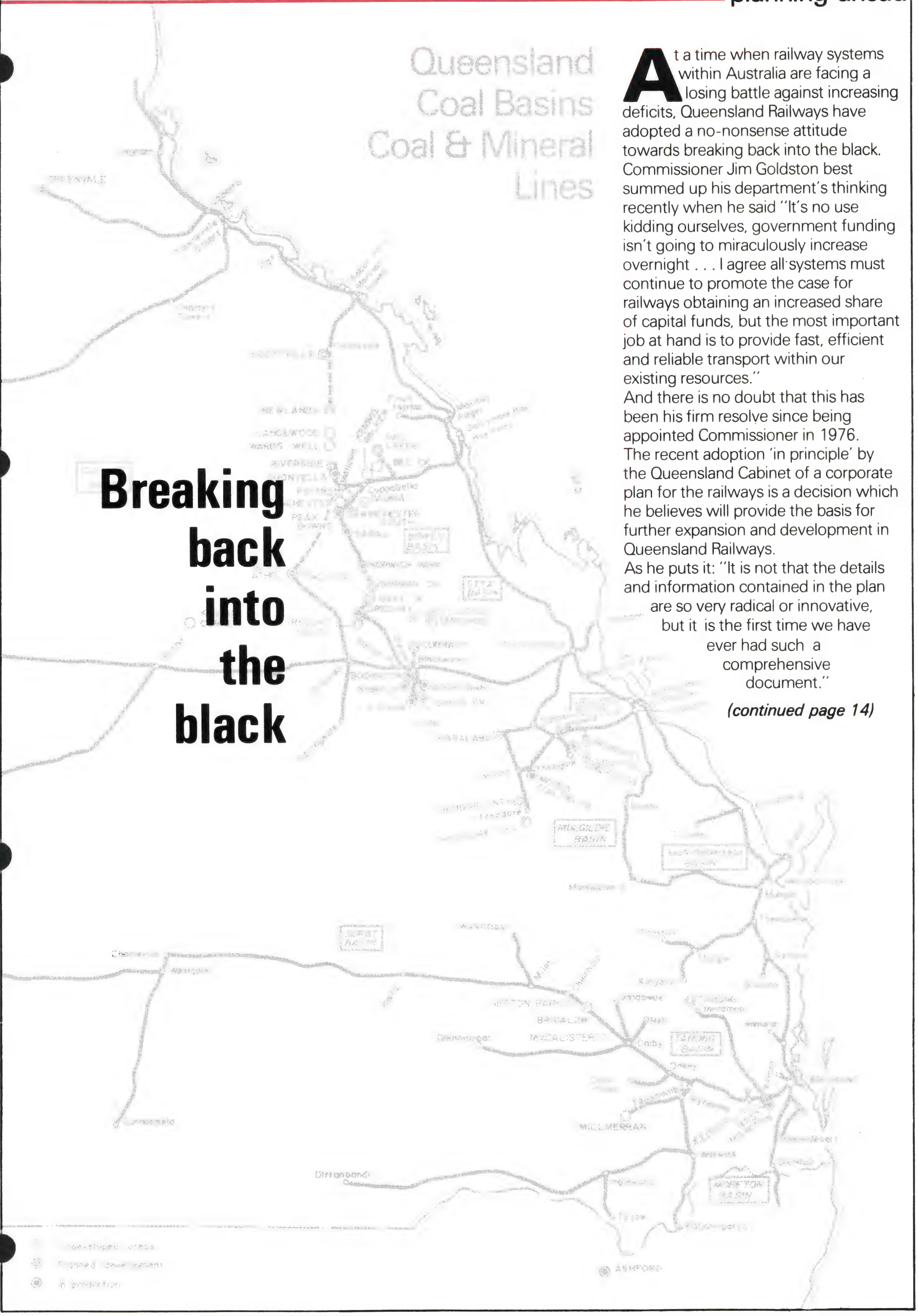
The busiest railway tracks in Australia are believed to be those through Wynyard (High Level) in Sydney, serving (northbound) the North Shore, and (southbound) the fast Southern and Western, and the Main Northern lines. These two tracks project north across the Bridge to North Sydney, where they also involve the longest and hardest suburban system grades (a 1 in 30 and 1 in 40 northbound climb to the centre of the Harbour Bridge). In the other direction, they parallel the main lines south and west to Strathfield. The total length of this backbone trunk sector is 18 km and it includes both city underground operation with closely-spaced stations, and express running on open tracks at speeds of up to 90 km/h. A flow of 24 trains/h is about the practical maximum that can be attained on a line where the trains have to be fed into a cross-town route, without full computer control and from a number of mixed-function suburban routes. For elsewhere in the Sydney system, these electrics share trackage with such diverse traffic as Lithgow coal trains, inter-capital express freights, and Southern Aurora.

Every effort is made to operate this busy line exclusively with full eight-car sets of two-deck stock offering 960 seats and in reasonable comfort, around another 240 standees. The comfortable capacity of the system is around 29 000 people/h and during the height of the peak this flow rate is often attained. Even with the old one-deck trains, loads of up to 1 600 per train have been noted, suggesting an absolute maximum practical rate of around 35 000 people/h. But it is doubtful whether, given so tight a jam, loading delays would allow a sufficient throughput of trains to sustain this flow rate for long.

Now that there are six rather than four tracks on Melbourne's Flinders Street/Spencer Street viaduct, the ne busiest line is believed to be the Ringwood/Box Hill Loop track,

(continued on page 52)

Breaking back into the black


Queensland Coal Basins Coal & Mineral Lines

At a time when railway systems within Australia are facing a losing battle against increasing deficits, Queensland Railways have adopted a no-nonsense attitude towards breaking back into the black. Commissioner Jim Goldston best summed up his department's thinking recently when he said "It's no use kidding ourselves, government funding isn't going to miraculously increase overnight . . . I agree all systems must continue to promote the case for railways obtaining an increased share of capital funds, but the most important job at hand is to provide fast, efficient and reliable transport within our existing resources."

And there is no doubt that this has been his firm resolve since being appointed Commissioner in 1976.

The recent adoption 'in principle' by the Queensland Cabinet of a corporate plan for the railways is a decision which he believes will provide the basis for further expansion and development in Queensland Railways.

As he puts it: "It is not that the details and information contained in the plan are so very radical or innovative, but it is the first time we have ever had such a comprehensive document."

(continued page 14)

Indeed, such is the faith that Queensland transport minister Don Lane has in the projections contained in the corporate plan and the ability of his system to fulfil them, he is confidently predicting that Queensland Railways will operate at a working profit by 1985-86 and by the following year, he tips that Queensland will be back in the black.

Most certainly much of this optimism is based on projected massive increases in bulk coal hauls, but what is more important is the manner in which the plan proposes to establish Queensland Railways as a pace-setter of the transport industry by the turn of the 21st century.

The key word is 'flexibility'.

Commissioner Goldston emphasises: "What we are talking about is not a fixed plan in the accepted sense, it is a concept of on-going planning — a dynamic process geared to adjust itself to constantly changing conditions and circumstances.

"In the past, the railways have had a dedicated and loyal staff, but in these changing times it is not enough. We must be able to look ahead, anticipate changes and to grasp opportunities as they arrive.

"We must not allow pre-conceived ideas to stifle initiative and enlightened thinking."

He believes that guidelines set out in the plan will go a long way towards overcoming such attitudes as they provide for manpower training schemes that will have far-reaching effects.

"We have the expertise and we must make the maximum use of it . . . and we must get this message across, not only within the organisation, but into the marketplace.

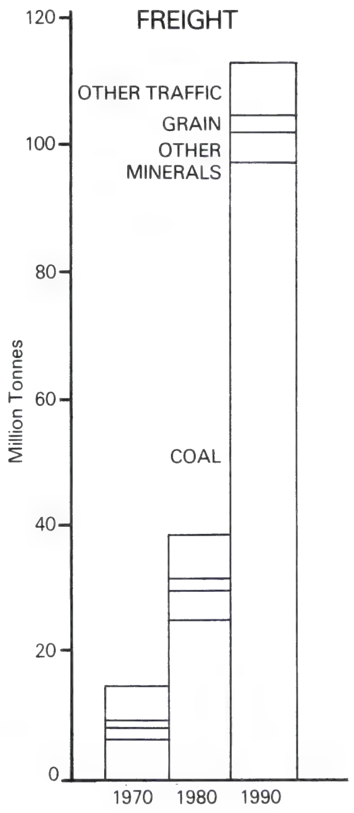
"I believe that the adoption of a corporate planning approach will bring Queensland Railways into line with modern business practices currently followed by many successful organisations throughout the world. Its successful introduction should permit our organisation to be more adaptive to change, better co-ordinated, increasingly aware of customer needs, receptive to staff expectations and to project a better image."

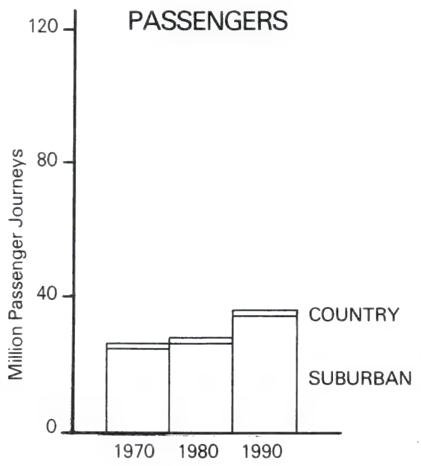
Mr Goldston says the plan is derived from three main sources:

- Operational plans
- Development plan
- Manpower plan

"These plans are continuously monitored and assessed, as a result of which there are regular updates of the traffic, revenue and manpower forecasts upon which planning is based. This monitoring is achieved by setting up 'measures of performance' which are directed at a number of key result areas."

Certainly many of the concepts outlined in the plan are just that, concepts, and as such their value to Queensland Railways is difficult to measure.





An indication of the impact of the projected traffic increase 1980-1990, after taking into account the impacts of the coal traffic foreshadowed above and the upsurge in suburban passenger traffic is illustrated in Figure 1 above.

But, most importantly, the plan is realistic. It has been developed by railways staff for railways staff . . . and their involvement will help to ensure the on-going corporate planning process does not waver.

Perhaps the best way to gauge the enormity of the challenges facing the system is to look at what is required over the next three to four years to provide for mineral projects which have already been committed to transport by rail.

It has been estimated that $493 million provided by mining companies is being spent to provide modern facilities and equipment, to upgrade and duplicate sections of existing railway and to build new spur lines to modern standards. This includes:

- Approximately 140 new locomotives
- Approximately 3000 new coal wagons
- 254 new rooms for trainmen's quarters
- 243 new houses
- 95,000 tonnes of rails
- 952,000 cubic metres of ballast
- Major upgrading of workshops, including the provision of a new complex at Parkhurst near Rockhampton
- A new locomotive depot at Merinda (near Bowen) for the Scottsville/Newlands projects and the extensions of existing ones at Callemondah (near Gladstone) and Jilalan (near Sarina)
- The major extension of centralised traffic control to cover proposed new mineral lines and planned duplicated sections of the north coast, central and Goonyella railways.
- Improved communications through the major upgrading of existing pole routes which carry C.T.C. on the central and Goonyella railways and between Townsville and Bowen by the installation of microwave equipment.
- New office accommodation at Mackay and Townsville for train control centres.

Overall, the plan presents the best set of options for impact on operational efficiency and to meet government policy designed to achieve a stronger railway system.

In the words of Commissioner Goldston: "It is a blueprint for the consolidation of Queensland Railways as a major contributor to government endeavours which are aimed towards greater prosperity of the State."

Ada gives 'bubbly' start to XPT

Rail travel in Australia entered the 'next generation' on April 8 when the State Rail Authority's Inter-City XPT went into regular service between Sydney/Orange/Dubbo.

After a period of trialling and testing throughout NSW during which world-wide attention was focussed on the sleek super train, 'Central West XPT' was farewelled from Sydney Central Station in a ceremony to mark the new era in luxury rail travel.

The honour of farewelling 'Central West XPT' on her inaugural public journey was given to Mrs Ada Quinnell, nearly 90 years of age, who is a well known Lithgow railway identity.

Mrs Quinnell was employed on the railways for over 20 years and honoured last year by rail workers who elected her a life member of the Retired Employees Association.

After Mrs Quinnell was invited by SRA Chairman, Mr Alex Carmichael, to break a bottle of champagne on the front power car, rail history was made when 'Central West XPT' glided out on time at 8:08 am.

Mrs Quinnell's two sons who are employees of the State Rail Authority were present at the historic ceremony.

One son, Henry Watterson worked on the inaugural train as Travelling Locomotive Inspector, and another son Jack Watterson, an Engineman, also travelled on the train.

At major centres en route to Dubbo, the inaugural train broke through banners and was welcomed by local government officials and thousands of onlookers who thronged stations and trackside to see the historic first journey.

XPT has lifted NSW country travel to a level of comfort equal to anything available anywhere in the world, while significantly cutting travelling times between country centres and Sydney.

Central West XPT' now serves major centres between Sydney and Orange Mondays to Saturdays inclusive. On Mondays, Wednesdays and Fridays it operates to and from Dubbo.

XPT's travelling time for the 462 km journey from Sydney to Dubbo is six hours 29 minutes, slashing two hours off the previous schedule.

Journey times and savings for other major towns on the Central Western route are:

	Journey Time	Saving
Orange	4 hours 44 minutes	1 hour
Bathurst	3 hours 27 minutes	41 minutes
Lithgow	2 hours 18 minutes	22 minutes

More XPT's. Plans are well advanced for the introduction of similar XPT trains on other NSW country routes.

XPT has since started a regular service on the North Coast between Sydney and Kempsey. It provides a day return service for passengers between Kempsey and Sydney, departing Kempsey early in the morning and returning in the evening. It allows day-return passengers about six hours in Sydney or about ten hours in Newcastle.

Passengers for the Upper Hunter Valley can connect with this XPT service at Maitland to also have day-return travel.

It is anticipated that in August 1982 an XPT service will begin operating between Sydney and Albury six days a week. This will be followed by a New England XPT service to Glen Innes three days a week, extending to Tenterfield on Mondays and Wednesdays.

Future plans also include Canberra being linked with Sydney by an XPT service.

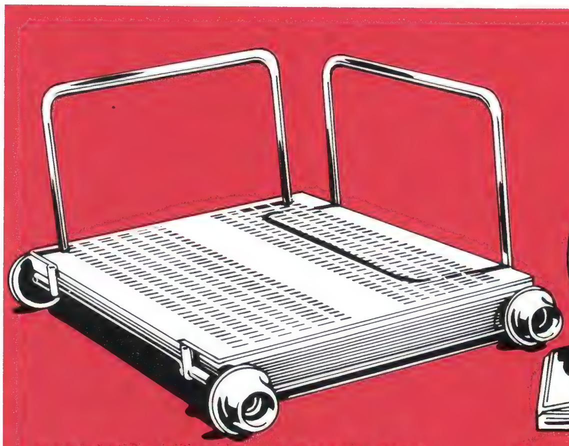
Other Improvements. The progressive introduction of XPT services is permitting the release of other carriages for modernisation and upgrading. Among these will be the conversion of all 900 class units ,to new self-propelled trains to be known as 'SP2'. Trains being upgraded under this programme will have bigger engines, better bogies and improved seats, as well as new colour schemes inside and out.

Introduction of Inter-City XPT units highlights the dramatic and spectacular improvements being made by the State Rail Authority to country rail travel in NSW.

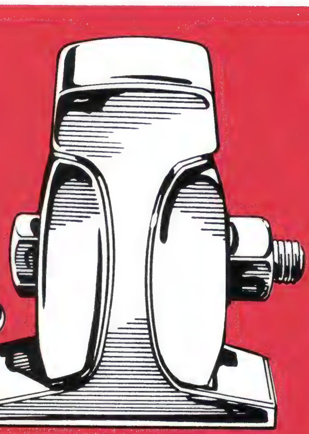
The programme, now well advanced, promises new and better trains, greater comfort and service. It is the State Rail Authority's response to the challenges created by the revival in usage of the NSW rail system which has resulted in a jump of almost 50 per cent in country rail travel.

Rail passengers in NSW are certainly getting a new deal with the improvements now under way which represent the most significant upgrading of the State's services for more than 30 years.

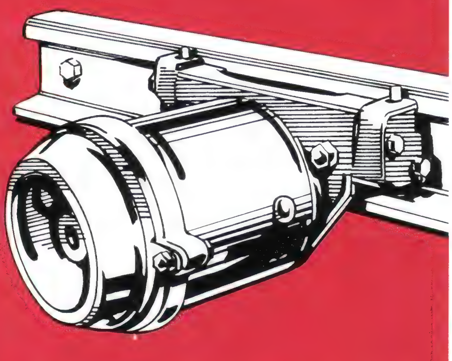
Mrs Ada Quinnell, a retired NSW Rail employee, about to release the bottle of champagne to commemorate the opening of XPT regular services on the Central West Route.



SAFETRAN PORTABLE TRACK CAR
This lightweight all-aluminium unit for all gauges is quickly assembled by one man. Transports loads of up to 3000 kg.

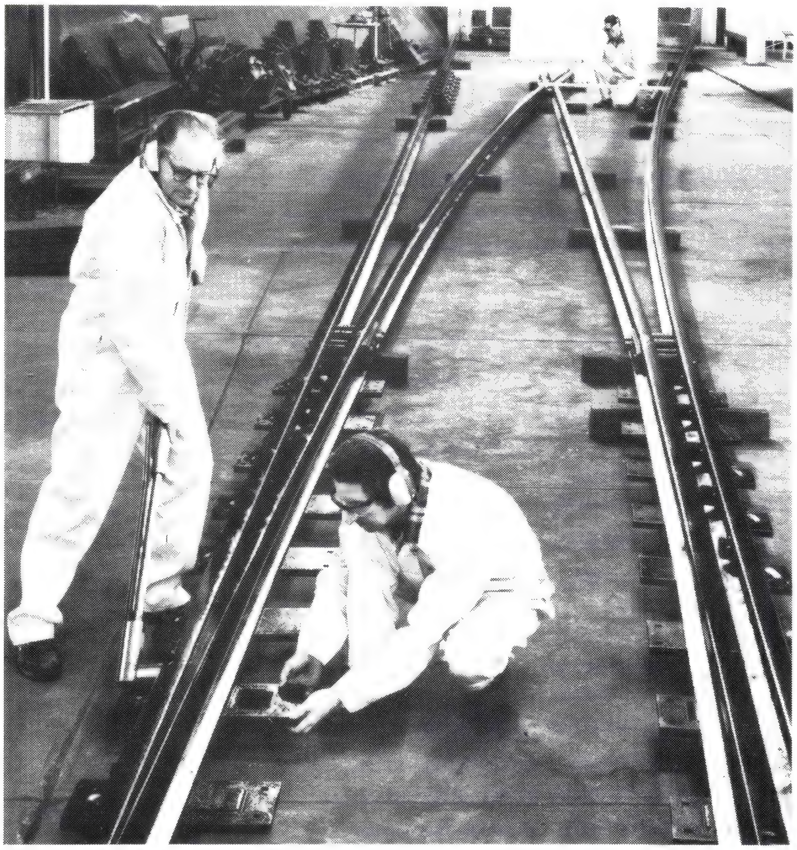


PORTEC BONDED RAIL JOINTS
Provide extremely strong, permanent, maintenance-free joints. Manufactured in both straight and curved arrangements to State Rail specifications.



PORTEC CURVE LUBRICATOR
Wheel activated to deliver grease to side of rail head, where flanges distribute it to the running face for extended rail and wheel flange life.

Portec trackwork equipment shunts across to Thompsons-Byron Jackson.



For over 85 years, Thompsons-Byron Jackson have worked for most railways in Australia and New Zealand. We've supplied them with all necessary trackwork and accessories, and pioneered many technological advances.

Now we're proud to announce a major addition to our range. And that's the full range of famous Portec trackwork equipment. Three typically useful Portec products are illustrated above. The entire Portec range is now sold and serviced exclusively through our offices in all mainland states.

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'Get into training' says AN

A major rail passenger promotion campaign instituted by Australian National in South Australia during February is being extended to other State capitals.

The $200,000 scheme to boost public awareness of train travel especially on AN's major transcontinental expresses is the most extensive ever seen in SA. The ultimate goal is to maximise patronage of world class trains like the Indian Pacific, Trans Australia, the Ghan and the Overland.

An important aspect of the campaign has been the involvement of travel agents.

"In recognising the crucial role that travel agents and tour wholesalers will play in realising our goal, our strategy has been to develop a range of merchandising 'tools' for their use", AN Chairman Mr Lou Marks said.

"These tools are in the form of a Travel Agents training kit which comprises a brochure, poster, new timetables and fares, and details of the advertising campaign. AN also introduced their special 'Get into Training' newsletter for agents. This detailed AN's special 20% June and July discount on travel to Perth and introduced the new AN Westventure Escorted Tour. The newsletter was written especially for agents and it will continue to regularly let them know about special offers, and other information relating to rail travel.

"We've put a lot of effort into this campaign, not only from the consumers' point of view, but to make it easier for agents", Mr Marks added.

The strategy was spearheaded in Adelaide by an 18 week media advertising campaign in daily newspapers and television.

Accompanying this was the release of a glossy 16 page full colour booklet which says in one volume what each of the individual product brochures are currently saying, and more. It provides answers to the 'most asked questions' about train travel. It gives information on package tours and tells about Australian National. Under a thematic umbrella of 'Get into Training' the advertising is designed to project a positive, responsible and contemporary image for Australian National.

The campaign is fully integrated, by the use of actual AN staff and passengers throughout.

The essential benefits that the campaign expresses are the comfort and romance of train travel with high standards of service, friendliness of staff, quality and variety of meals, the beauty of the landscape, and value for money.

After its second run in Adelaide during June, the advertising campaign will be extended to AN's key interstate markets of Melbourne, Sydney and Perth.

This renewed effort to promote passenger travel by rail, especially on key interstate routes, is an indication that AN has now commenced to address a series of problems in the areas of passenger marketing and operating.

"While they have long been recognised, it was essential to attend to other priorities requiring attention immediately upon the formation of AN in 1975", Mr Marks said.

"In conjunction with Railways of Australia we are now reasonably confident that within the year we should have computerised booking services for every interstate and major long distance train in Australia, and I'm also confident that the availability of such a system will eliminate the bulk of customer complaint.

"Australian National really does play a much more significant role in the State's tourism scene that at first meets the eye. In the 1981 calendar year a total of 230,000 passengers travelled on the Overland between Adelaide and Melbourne.

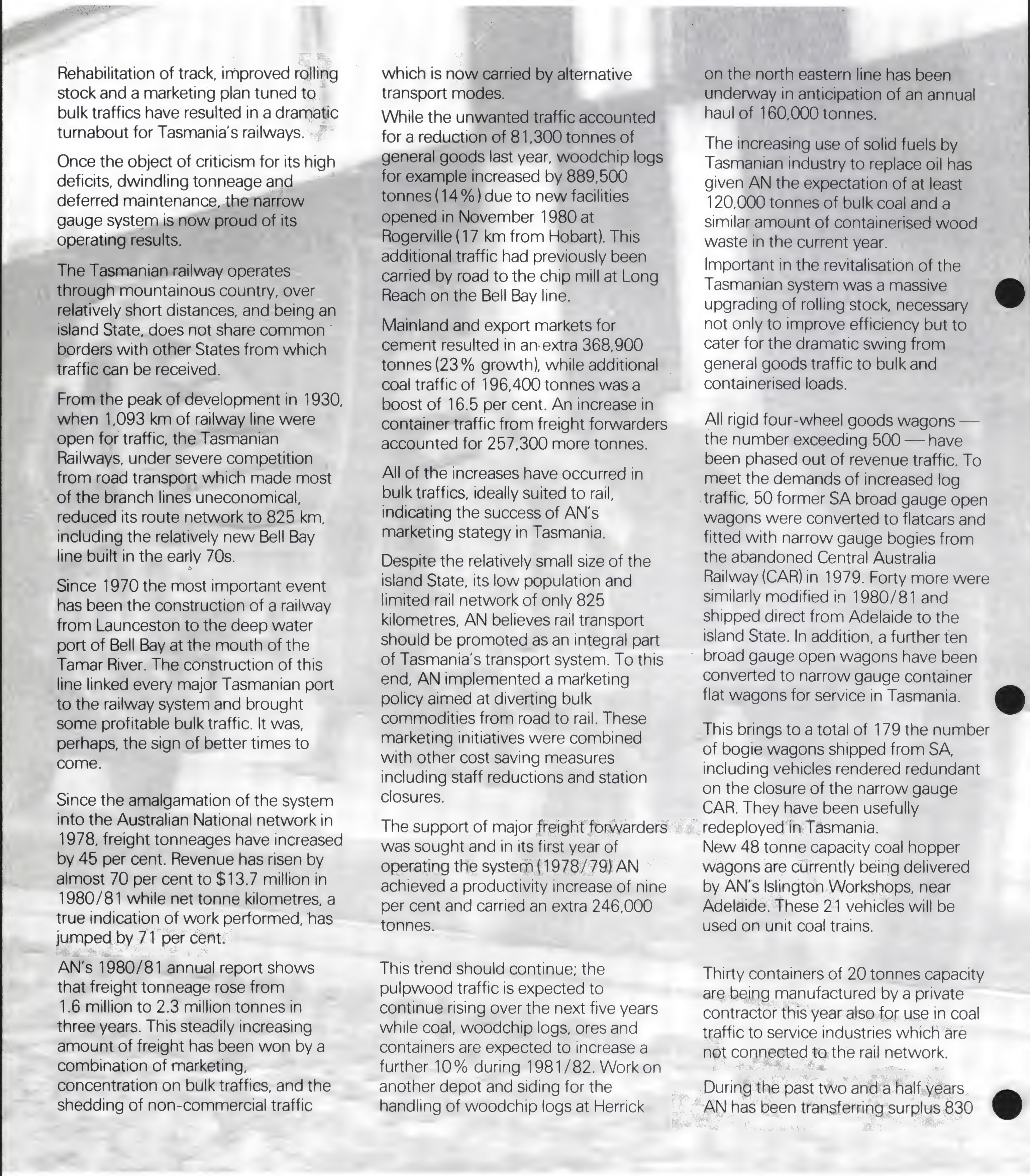
The Overland from Melbourne to Adelaide represented six per cent of all tourists travelling to Adelaide.

"On the Ghan more than 24,000 people travelled; the Trans-Australian 38,000 passengers and the Indian Pacific nearly 40,000 passengers", he said.

"AN's major difficulty is getting people over that initial apprehension of booking their holiday by train. We know that they will enjoy it immensely, we know our staff will do their utmost to look after them and probably more importantly we know that we are offering real value for the tourist dollar when compared to some of the other modes of travel."

Mr Marks added: "AN believes the campaign will signal the start of a resurgence in rail travel to, and through, South Australia."

It's a turnabout for



Rehabilitation of track, improved rolling stock and a marketing plan tuned to bulk traffics have resulted in a dramatic turnabout for Tasmania's railways.

Once the object of criticism for its high deficits, dwindling tonneage and deferred maintenance, the narrow gauge system is now proud of its operating results.

The Tasmanian railway operates through mountainous country, over relatively short distances, and being an island State, does not share common borders with other States from which traffic can be received.

From the peak of development in 1930, when 1,093 km of railway line were open for traffic, the Tasmanian Railways, under severe competition from road transport which made most of the branch lines uneconomical, reduced its route network to 825 km, including the relatively new Bell Bay line built in the early 70s.

Since 1970 the most important event has been the construction of a railway from Launceston to the deep water port of Bell Bay at the mouth of the Tamar River. The construction of this line linked every major Tasmanian port to the railway system and brought some profitable bulk traffic. It was, perhaps, the sign of better times to come.

Since the amalgamation of the system into the Australian National network in 1978, freight tonneages have increased by 45 per cent. Revenue has risen by almost 70 per cent to $13.7 million in 1980/81 while net tonne kilometres, a true indication of work performed, has jumped by 71 per cent.

AN's 1980/81 annual report shows that freight tonneage rose from 1.6 million to 2.3 million tonnes in three years. This steadily increasing amount of freight has been won by a combination of marketing, concentration on bulk traffics, and the shedding of non-commercial traffic which is now carried by alternative transport modes.

While the unwanted traffic accounted for a reduction of 81,300 tonnes of general goods last year, woodchip logs for example increased by 889,500 tonnes (14%) due to new facilities opened in November 1980 at Rogerville (17 km from Hobart). This additional traffic had previously been carried by road to the chip mill at Long Reach on the Bell Bay line.

Mainland and export markets for cement resulted in an extra 368,900 tonnes (23% growth), while additional coal traffic of 196,400 tonnes was a boost of 16.5 per cent. An increase in container traffic from freight forwarders accounted for 257,300 more tonnes.

All of the increases have occurred in bulk traffics, ideally suited to rail, indicating the success of AN's marketing stategy in Tasmania.

Despite the relatively small size of the island State, its low population and limited rail network of only 825 kilometres, AN believes rail transport should be promoted as an integral part of Tasmania's transport system. To this end, AN implemented a marketing policy aimed at diverting bulk commodities from road to rail. These marketing initiatives were combined with other cost saving measures including staff reductions and station closures.

The support of major freight forwarders was sought and in its first year of operating the system (1978/79) AN achieved a productivity increase of nine per cent and carried an extra 246,000 tonnes.

This trend should continue; the pulpwood traffic is expected to continue rising over the next five years while coal, woodchip logs, ores and containers are expected to increase a further 10% during 1981/82. Work on another depot and siding for the handling of woodchip logs at Herrick on the north eastern line has been underway in anticipation of an annual haul of 160,000 tonnes.

The increasing use of solid fuels by Tasmanian industry to replace oil has given AN the expectation of at least 120,000 tonnes of bulk coal and a similar amount of containerised wood waste in the current year.

Important in the revitalisation of the Tasmanian system was a massive upgrading of rolling stock, necessary not only to improve efficiency but to cater for the dramatic swing from general goods traffic to bulk and containerised loads.

All rigid four-wheel goods wagons — the number exceeding 500 — have been phased out of revenue traffic. To meet the demands of increased log traffic, 50 former SA broad gauge open wagons were converted to flatcars and fitted with narrow gauge bogies from the abandoned Central Australia Railway (CAR) in 1979. Forty more were similarly modified in 1980/81 and shipped direct from Adelaide to the island State. In addition, a further ten broad gauge open wagons have been converted to narrow gauge container flat wagons for service in Tasmania.

This brings to a total of 179 the number of bogie wagons shipped from SA, including vehicles rendered redundant on the closure of the narrow gauge CAR. They have been usefully redeployed in Tasmania.

New 48 tonne capacity coal hopper wagons are currently being delivered by AN's Islington Workshops, near Adelaide. These 21 vehicles will be used on unit coal trains.

Thirty containers of 20 tonnes capacity are being manufactured by a private contractor this year also for use in coal traffic to service industries which are not connected to the rail network.

During the past two and a half years AN has been transferring surplus 830

Tasmania's rail

class Goodwin-Alco 730 kW branchline locomotives from SA for use in Tasmania. Apart from the necessity to augment and replace ageing ex-TGR locomotives, they are equipped with Westinghouse airbrakes compatible with the former mainland rolling stock.

Twelve of the former South Australian Railways' locomotives have been transferred, and one more is expected to follow. This class is unique in its widespread use in that it has worked on all narrow, standard and broad gauge lines of the former SAR, and its use is now extending gradually throughout Tasmania. The ubiquitous 830s have also operated on hire in NSW and have been seen on former Commonwealth Railways' tracks at least as far as Port Augusta.

Changing freight handling methods have also contributed to the revitalisation of rail in Tasmania.

Containerisation is playing a major role, not only in the heavy interstate traffic which is shipped from Launceston. The Launceston freight terminal is now the distribution centre for containers moving by rail between the mainland and Tasmania and between major Tasmanian centres.

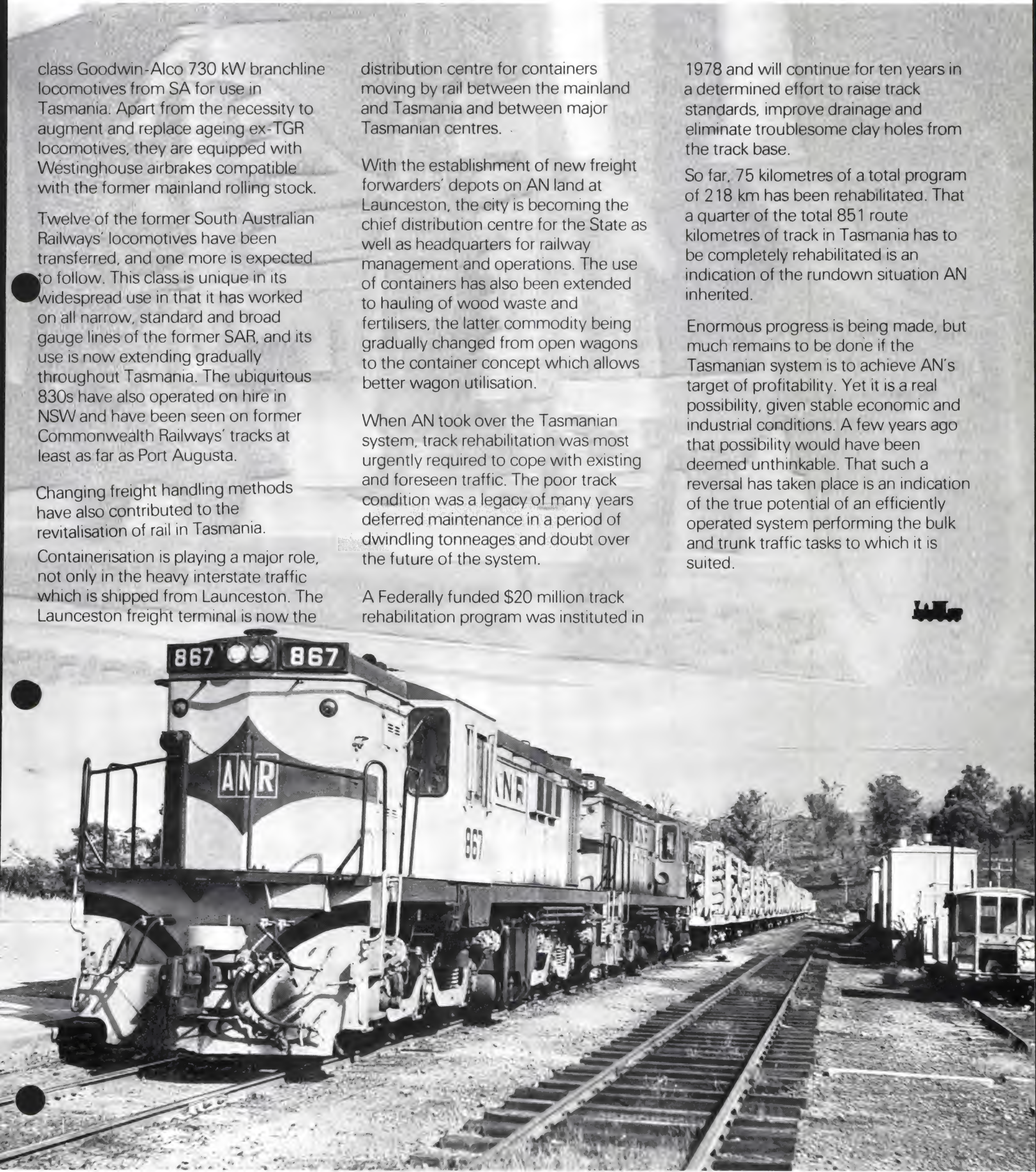
With the establishment of new freight forwarders' depots on AN land at Launceston, the city is becoming the chief distribution centre for the State as well as headquarters for railway management and operations. The use of containers has also been extended to hauling of wood waste and fertilisers, the latter commodity being gradually changed from open wagons to the container concept which allows better wagon utilisation.

When AN took over the Tasmanian system, track rehabilitation was most urgently required to cope with existing and foreseen traffic. The poor track condition was a legacy of many years deferred maintenance in a period of dwindling tonneages and doubt over the future of the system.

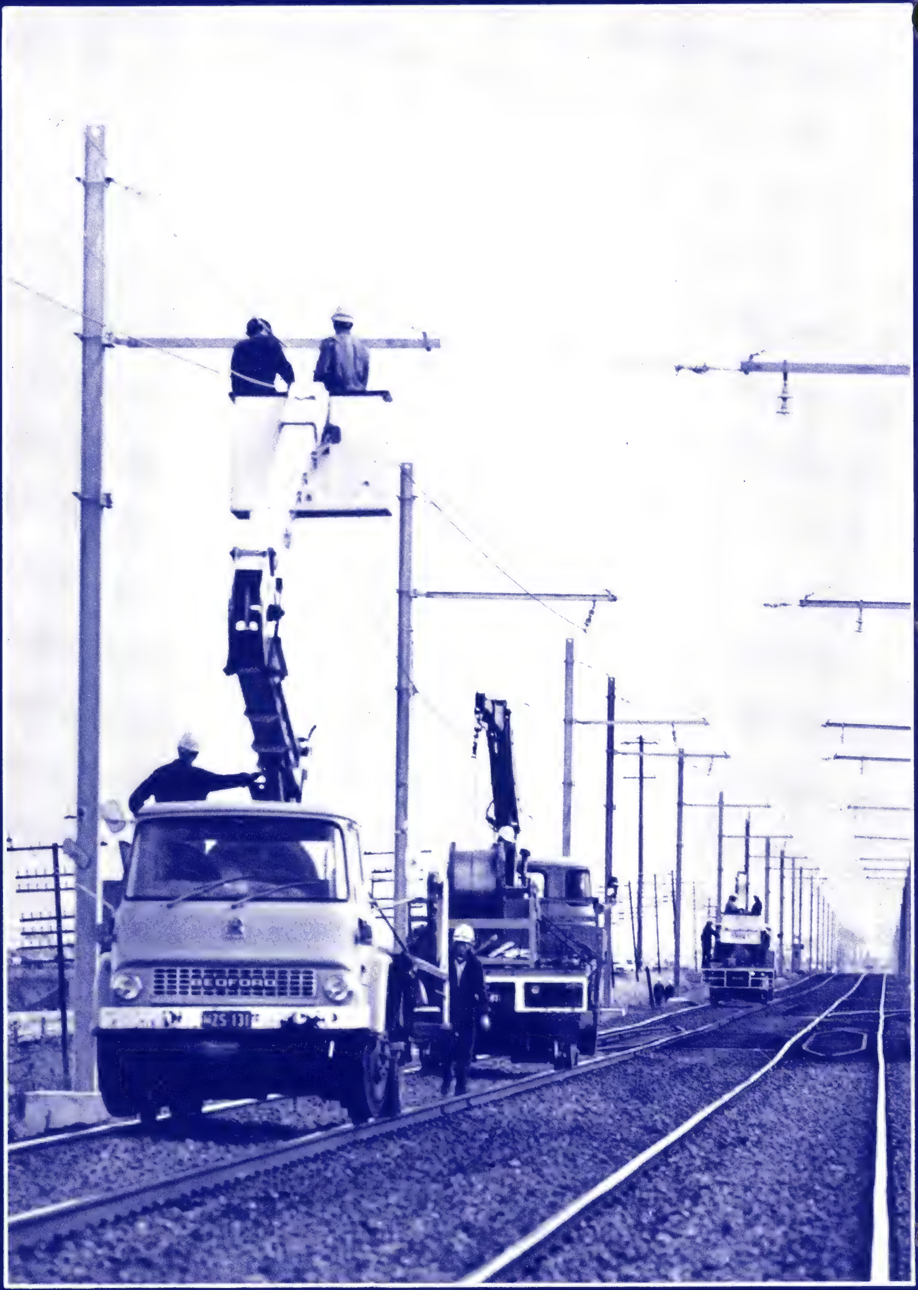
A Federally funded $20 million track rehabilitation program was instituted in 1978 and will continue for ten years in a determined effort to raise track standards, improve drainage and eliminate troublesome clay holes from the track base.

So far, 75 kilometres of a total program of 218 km has been rehabilitated. That a quarter of the total 851 route kilometres of track in Tasmania has to be completely rehabilitated is an indication of the rundown situation AN inherited.

Enormous progress is being made, but much remains to be done if the Tasmanian system is to achieve AN's target of profitability. Yet it is a real possibility, given stable economic and industrial conditions. A few years ago that possibility would have been deemed unthinkable. That such a reversal has taken place is an indication of the true potential of an efficiently operated system performing the bulk and trunk traffic tasks to which it is suited.



VicRail wiring sets crackling pace



Work proceeds on the electrification of the Newport to Werribee line with this section of wiring being installed between Paisley and Galvin.

In early May, VicRail reached an important milestone in the Newport to Werribee electrification project with installation of the first portion of overhead electrical wiring.

The Overhead division of VicRail's Electrical branch installed two kilometres of wiring between Paisley and Galvin. Project Manager, Ian Cook, said the 21 kilometres electrification project between Altona Junction and Werribee Racecourse platform was running to schedule and should be completed by June 1983.

"Nearly all 600 steel overhead staunchions have been placed in position. The remainder will be installed as soon as track alterations at Werribee and Hoppers Crossing stations are complete", Mr Cook said.

A new concept, based on the latest European practice for high-speed train running has been used for the design of the overhead. This new design uses a cantilever type structure which is economical to install and allows for fittings to be attached before it is erected.

Mr Cook said work on the electrical sub-station construction and extension program was progressing well.

"Extensions to Paisley sub-station have been completed while at Aircraft, near Laverton, installation of electrical equipment has commenced", he said.

"Construction of buildings at Hoppers Crossing and Galvin are almost complete. Werribee the underground earthing grid has been positioned with construction of the building about to start".

As with the overhead staunchions, new design concepts are being used in the sub-station construction.

In an attempt to make these buildings blend in with the environment, cables to the sub-stations run underground and all equipment is housed inside the building.

Other sub-stations in the metropolitan area have their switchgear fitted outside the building, enclosed behind a wire mesh fence. Cables in these sub-stations were attached aerially.

Inside the new sub-stations the cables are located in an above ground basement with the signalling, switchgear rectifier unit and other equipment positioned on a raised concrete base.

Power to operate suburban trains is supplied by the State Electricity Commission at various locations throughout the suburban network.

It is then distributed to sub-stations where rectifier equipment converts the electricity to direct current, suitable for use by trains while transformers cut down the voltage for signals.

Straight thru' in '82

Sydney's electric train network was extended further on April 3, 1982 when the Premier of New South Wales, Hon. Neville Wran, QC, MP, officially opened the $28 million electrification of the Main Northern Line between Gosford and Wyong.

Introduction of electric trains between Gosford and Wyong brought a new era of passenger travel comfort for commuters and tourists on the rapidly developing Central Coast of New South Wales.

The State Rail Authority's sleek double-decked inter-urban trains, fully air-conditioned, now serve Wyong direct from Sydney, making it unnecessary for the previous change of trains at Gosford.

Other improvements resulting from the electric train service between Sydney and Wyong include:

- More reliable 'on time' running of trains.
- Better comfort and greater seating capacity on the double-decked trains which replaced older services.
- Extra trains between Gosford and Wyong offering an improved service for Wyong passengers, and those travelling to and from the intermediate stations.
- Elimination of the need for many commuters to drive from intermediate stations to Gosford, easing the pressure on parking at Gosford Station.

On the official opening day, Wyong took on a festive atmosphere, with the Railway Institute band entertaining the thousands of local residents awaiting the arrival of the Premier, Official Party and invited guests on a special double-decked train inaugurating the new 'thru' service.

Completion of the Gosford/Wyong electrification project marked a further step in the SRA's $105 million programme of linking NSW's two most populous cities — Sydney and Newcastle — by electric trains.

To date, the overall expenditure on the Sydney/Newcastle project is $51 million.

To provide for the Gosford/Wyong extension, new substations were built at Ourimbah and Wyong. Electrical section huts were installed at Niagara Park and Tuggerah.

Major trackwork including ballast cleaning, re-aligning, sledding, joint welding and partial resleepering were also carried out on the 20km of double track.

Extensive earthworks, such as the widening of cuttings and embankments, were also necessary to facilitate installation of electrical equipment. These will allow improved access for maintenance.

Signalling was upgraded over the whole Gosford-Wyong route, with coloured lights replacing the older type semaphore signals. The cost of new signalling and communication works alone was almost $5 million.

New overbridges were built at Ourimbah and Wyong, and 12 underbridges between Gosford and Wyong were altered.

Major station improvements also took place, with several platforms being extended to accommodate longer trains. Additional commuter car parking facilities were provided also for greater travel convenience of passengers.

Other station improvements were made, including:

Narara New 100 metre Wyong platform. Sydney platform resurfaced. New footbridge, waiting room and a commmuter car park for 46 cars;

Niagara Park New commuter car park for 20 cars;

Lisarow New 100 metre platforms have been built and a commuter car park for 24 cars will soon be provided;

Ourimbah New 120 metre Sydney platform constructed and station footbridge raised;

Tuggerah New Sydney platform with waiting room, toilet and parcels office. Extension of Wyong platform with new waiting room, and a new commuter car park for 50 cars;

Wyong Station footbridge raised, new train crew facilities room and the provision of additional commuter car parking. A passenger sales travel lounge has also been provided as well as remote controlled platform indicators for Sydney trains.

Wyong/Newcastle Project.

Work is well advanced on electrification of the Wyong/Newcastle section. More than 70 per cent of major civil engineering and track upgrading works have been completed and bridgeworks, station improvements, signalling and electrical works are progressing well. Depending on available finance, electric passenger trains should be operating between Sydney and Newcastle by mid 1984.

Wyong took on a festive air as the Premier, Mr Wran officially opened the $28 million electrification of the main northern line between Gosford and Wyong.

Tourists see it all with coa

By Jack Morris

Westrail operates a comprehensive range of rail and coach tours and travel services throughout Western Australia and a variety of Australia wide tours involving interstate rail, sea and air services in conjunction with local tour operators.

Its point-to-point passenger travel services in Western Australia include two trains, the 'Australind' Perth-Bunbury daylight return service and the 'Prospector' Perth-Merredin-Kalgoorlie railcar service.

These trains are integrated with Westrail road coach services which operate as far north as sunny Geraldton, 502 km, and Meekatharra 922 km, south-east to the port of Esperance, 744 km, and to beautiful Albany, 509 km, on the southern coast.

The 'Australind' connects at Bunbury with an extensive road coach service throughout the lower south-west area including a return service operating on the very scenic 'King Karri' route through the picturesque karri forests, farmlands and orchards to and from Albany — a popular residential and tourist centre on the south coast.

The 'Prospector' is one of Australia's fastest and most modern trains and operates six return services weekly between Perth and the gold and mineral centre of Kalgoorlie 657 km east.

This popular first class train has all the features of a jetliner including air-conditioning, reclining seats, toilet-washrooms, music and commentary broadcasts and meals, drinks and refreshments served at seats from a stainless steel galley.

The 'Prospector' connects at Kalgoorlie with Westrail's thrice weekly return coach services to the port, tourist and agricultural town of Esperance.

Local tours. To provide a diverse range of tours, Westrail combines its train and road coach services with local tour operators and motel/hotel accommodation houses throughout the State.

These local tours range from one to nine days duration and include weekender tours to Albany, Geraldton/Kalbarri, on the mouth of the Murchison River, and the historic Goldfields as well as extended tours embracing both the Goldfields and Esperance, Albany, Bunbury and the South Coast and a nine-day tour north to Mt Augustus, which is twice as big

and rail

as Ayers Rock and located more than 1,000 km north of Perth.

The structure of Westrail's tours provides the ultimate in economical touring and at the same time gives tourists the advantages of travelling with local residents and the guidance of established tour operators who have that valuable local knowledge which adds considerable interest to Westrail tours.

Wildflowers. Western Australia is renowned for its wildflower wealth and possesses an estimated 7,000 species.

Westrail's expertise in operating its famous six-day wildflower tours has encouraged increasing patronage from all parts of the world.

An experienced botanist, hostess and coach captain ensures passengers gain the maximum benefit from these tours which operate at three-day intervals from late August until the end of October. The tours first capture the wildflower wealth of the warmer northern regions before swinging to the cooler climate of the south.

Features of these very popular tours include excellent motel accommodation, entertainment and picnic lunches and teas among the flowers.

Low priced package tours embracing travel on the famous 'Indian-Pacific' or 'Trans-Australian' passenger trains across Australia, combined with either a northern or southern wildflower tour or both tours, plus accommodation and tours of Perth and its attractions, are available from all Eastern States through the WA Government Travel Centres or accredited agents.

Ansett/Westrail wildflower tours including air travel from all points combined with accommodation and tours are also available.

Interstate package tours. As well as the Westbound tours, Westrail operates a variety of tours from Western Australia involving travel on the 'Indian-Pacific' or 'Trans-Australian' and other interstate train services. Included is a range of first class 'Indian-Pacific' holiday tours with the services of professional escort/entertainer who ensures that passengers are entertained throughout their tour and who relieves them of any accommodation, transport, luggage or meal problems.
These tours take passengers to the best tourist attractions of Queensland and its islands as far north as Cairns, throughout New South Wales, Canberra, Victoria, South Australia including Kangaroo Island, Tasmania and to Alice Springs, Ayers Rock, Darwin returning via the west coast. Westrail's other interstate packages include regular departures on the Murray River Queen, Tasmania rail/sail holidays, grand tours of South Australia, adventure tours to the Centre and 'Indian-Pacific' Sitmar Cruises on which return rail fares between Perth and Sydney are subsidised by $250 by Sitmar. Similar tours are currently being organised with P&O Cruises.

Perth Terminal, the arrival and departure point for interstate trains and Westrail's 'Prospector' and road coach services is Australia's most modern passenger terminal. It is located below the Westrail Centre, the administration headquarters and communication centre for the entire system.

Passenger facilities include the latest booking, travel centre and cloak room services on the same level as the platform and its 450 car parking bays. This design facilitates transfers between coaches, trains and cars.

All meals and refreshments are available from a stylish Westrail Restaurant tavern located on the first floor. This is an ideal venue to join friends for departures and arrivals.

An air-conditioned coach connects with the early morning arrival of the 'Indian-Pacific' and 'Trans-Australian' at Perth Terminal. After breakfast in the restaurant passengers may enjoy an orientation tour of Perth and its many attractions before they and their luggage are taken to their motels in time to immediately occupy their rooms.

A very interesting tour of Kalgoorlie and Boulder also operates to enable both westbound and eastbound train travellers to see many of the features of this inland goldmining centre during the trains' short stop-over at Kalgoorlie.

To match these extensive tour and travel services Westrail has recently established a modern and spacious travel centre conveniently located in City Railway Station, Wellington Street, Perth.

In addition to booking rail oriented tours, experienced consultants in this Centre also arrange accommodation and rental car bookings throughout Australia as well as local tours and other travel services.

Colourful brochures have been published to promote each of these tours and travel services and passengers are provided with comprehensive itineraries, maps and travel kits and are farewelled on every departure.

Tourism is Australia's fastest growing industry and Westrail has geared its resources to ensure that as both a major operator and an Agency it fulfills its theme of 'Westrail the holidaymakers'.

Judged among the best

Visitors to this year's Royal Agricultural Society's show were left in no doubt of the great rail revival currently taking place in New South Wales after they inspected the State Rail Authority's display.

An actual XPT power car and carriage, scale models of the SRA's passenger and freight trains, colourful photographs and dramatic audio-visual displays combined to show how $1 billion has been spent in the last five years in upgrading the State's public transport facilities.

Even better things are underway for NSW passengers and freight customers with a further $1.4 billion to be allocated in the next half decade.

The sleek streamlined XPT units provided a stark contrast to the full-sized replica of Stephenson's rocket, which was made available on loan by courtesy of the National Railway Museum, York, England.

Section of the SRA's display which featured a Stage Show designed to encourage school children to travel safely on public transport.

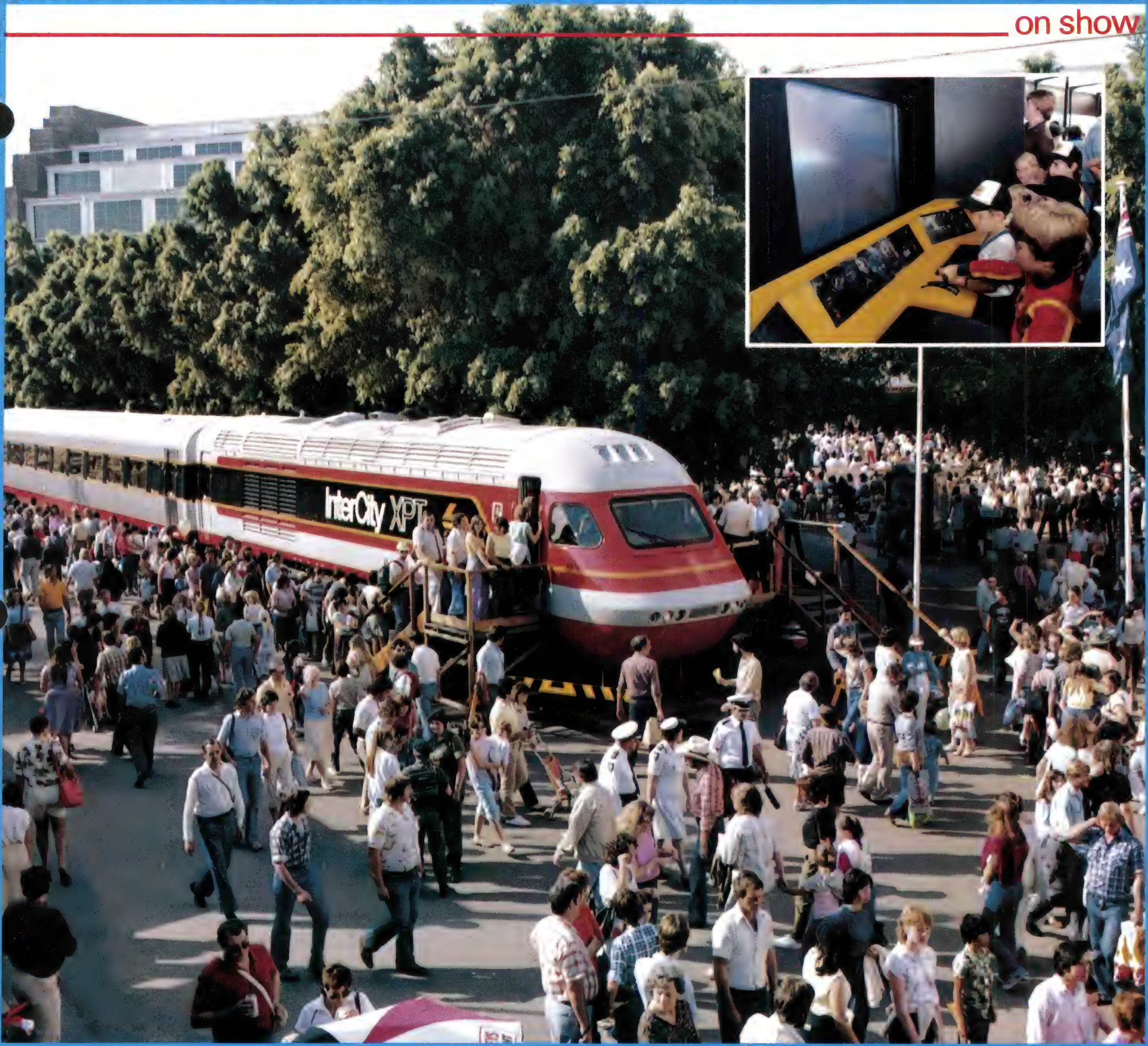
Stage show. In addition to these exhibits, the SRA arranged a live stage show featuring 'Clever Charlie' and an attractive dancing troupe which was designed to encourage school children to behave and make travel on public transport safer.

Large crowds assembled to watch the half-hour shows held at approximately two hourly intervals each day. The displays, arranged by the State Rail Authority, also highlighted the advantages of Urban Transit Authority bus, ferry and hydrofoil services.

A Mercedes articulated (bendy) bus and an old 'O' class tram created much interest with onlookers. Young and old alike were fascinated by the model railway, covering an area of over 35 square metres on which about 20 model locomotives and 160 passenger and freight vehicles operated in simulated rural and suburban landscapes.

Award winning displays. The undoubted popularity of the NSW public transport display was obviously shared by the RAS judges when awarding prizes for the best exhibits at the 1982 Royal Easter Show.

Out of the many hundreds of entries judged, the SRA/UTA display was awarded not one, but two first prizes — Best Exhibit and Best Commercial Exhibit.



Part of the SRA's award winning display showing hundreds of onlookers inspecting the XPT. Inset: 'Casey Jones' of the future 'driving' Intercity XPT from the simulated console at the Show.

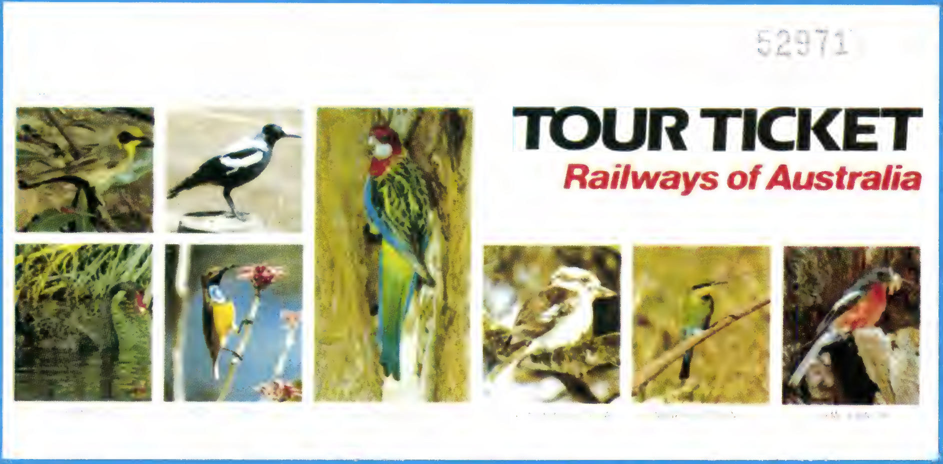
And here's another winner . . .

When designs were submitted for the ROA point to point sales ticket some years ago all Australian Railway Systems were enthusiastic about one particular design which featured Australian wildflowers and identified each State's wildflower symbol.

Now a new ROA tours ticket has been released; this time it will be a bird watchers' delight, as the tour ticket features native birds from each state on the front cover. Each bird is identified and the transparencies used for the tickets' production are particularly colourful.

The packaged tours prepared by various Systems represent outstanding value for money, and thousands of the new tickets will be distributed.

The new ROA tour tickets are available from interstate railway booking offices, tourist bureaux and travel agencies.



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TOUR TICKET

Railways of Australia

fettler's friend

Out on the lonely arid plains of the Nullarbor, the sound of a train invariably turns the heads of railway families — but one particular train whistle draws cries of "here comes the Tea and Sugar".

Whatever the time, residents of tiny settlements rush to meet the train, carrying with them or pushing a motley variety of bags, boxes, wheelbarrows or even prams and billycarts.

It's time for the weekly shopping, maybe to see a film, or consult a health nurse or even visit the dentist.

Bringing all the modern facilities of the city to one of the most desolate, lonely areas on Earth is the role of Australia's most unusual and famous train, known far and wide as the 'Tea and Sugar' train. The train is really nothing more than a weekly mixed goods train operating the 1689 kilometre standard gauge line from Port Augusta, South Australia, to Kalgoorlie in Western Australia.

En route it performs the many mundane tasks of a roadside goods train while transcontinental fast freight and express passenger trains pass it by in a cloud of dust. Such tasks include the distribution and collection of sleepers, rails and other permanent way materials for trackside maintenance gangs, or to deliver wagons or small loads which cannot be forwarded by the faster trains.

Its main function, however, remains to replace the non-existent shops at trackside camps and tiny towns.

The forerunner of the 'Tea and Sugar' train was the supply train which operated during the construction of the Trans-Australian Railway to bring to the construction workers the necessities of life. The line was built between 1912 and 1917 over country devoid of any population other than a few nomadic Aboriginals.

With the opening of the line for traffic the construction gangs were disbanded and a series of 'camps' were established at various locations to house station staff and train crews as well as the fettlers who maintained the track.

At certain larger depots provision stores operated by the Commonwealth Railways were set up but at other locations there were no shops from which food or other supplies could be obtained.

To provide supplies at such places and also to replenish stocks at the provision stores, it was necessary to run a supply train on a regular basis.

This train, like its predecessor, carried the basic staples such as tea, sugar, meat, groceries, etc., and it was soon affectionately called the 'Tea and Sugar' train by those who depended on its arrival for their food.

The train leaves Port Augusta every Thursday morning, taking five days for the trip to Kalgoorlie.

To enable as many 'camps' as possible to be served in daylight, the schedule of the 'Tea and Sugar' train provides for it to stable overnight at various locations.

When the train stops, the residents quickly distribute themselves between the butcher's van, the provision stores van and the Community Services car, and as quickly change to another unit when their business in the first is completed. When all the customers have been served and the water for the camp delivered, the train resumes its journey.

Many years ago the blessing of refrigeration made it possible to supply fresh meat and other perishables to communities dwelling in the extreme heat of the Nullarbor.

Now, the modern fully-equipped butcher's van, similar to a suburban butcher's shop, sells the best quality meats and smallgoods.

The supermarket car enables railway families to purchase a wide range of groceries, bread, fruit, vegetables, cigarettes, sweets and fresh milk.

Drapery and other household goods are also delivered in response to orders previously sent to the main Australian National provision store in Port Augusta.

Two of the new supermarket cars were designed and built by AN in 1980, replacing the old grocery car. While one is being restocked in Port Augusta, the other is out along the track in the 'Tea and Sugar' train.

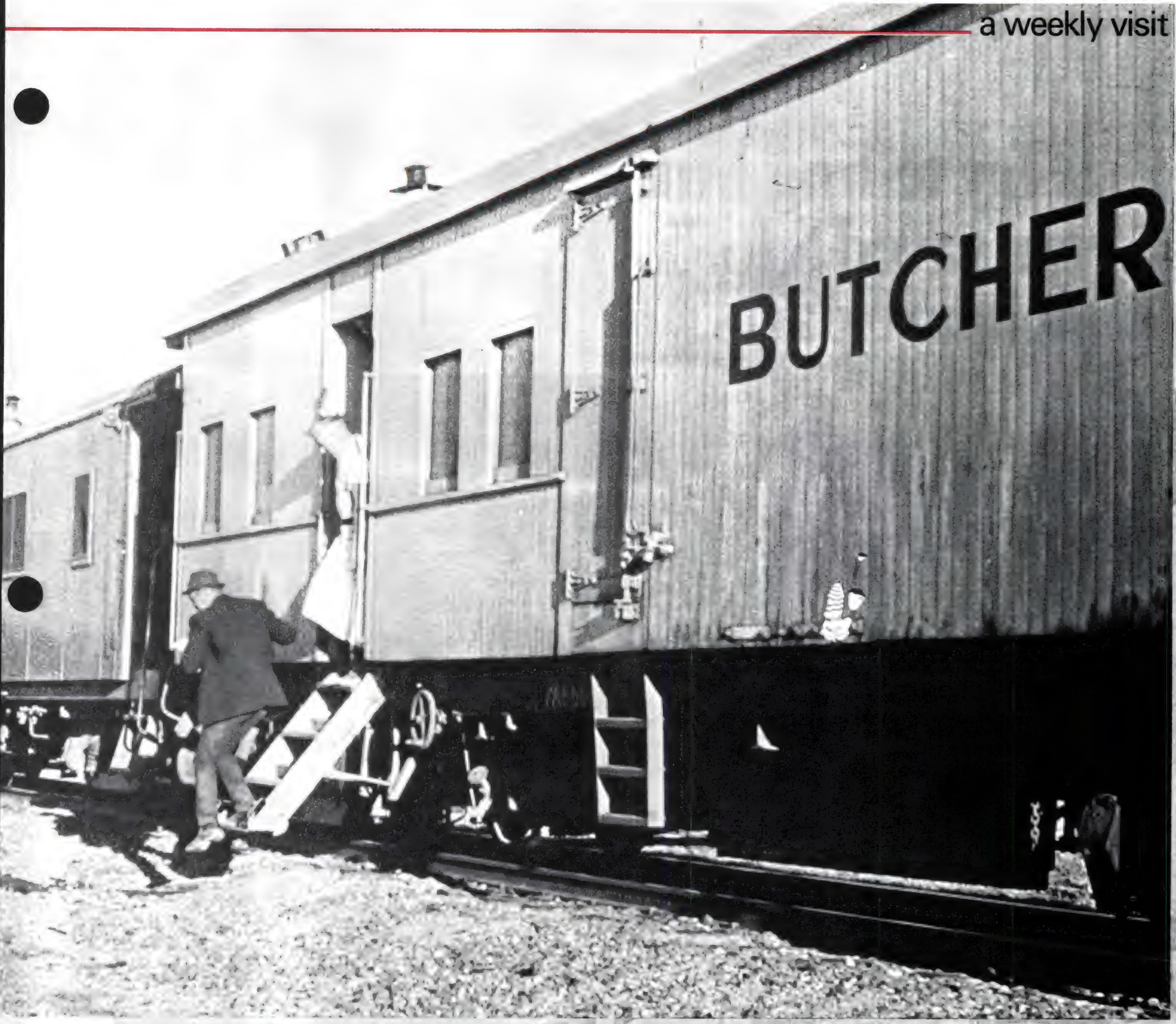
A 'theatrette' car makes regular visits to each location to present film shows which do much to reduce the isolation.

A passenger carriage is attached to the train for employees travelling from one location to another and there is no provision made for passengers in the way of sleeping accommodation or meals. For that reason and the time taken for the journey from Port Augusta to Parkeston, 'through' passengers are not permitted to travel on the train.

Here co

To supplement the rainwater which is collected in tanks provided at each residence on the Trans-Australian Railway, the 'Tea and Sugar' train conveys water in rail tank wagons. At the various camps the water is delivered into tanks alongside the line and later pumped to overhead tanks from which it is reticulated to the residences.

Since 1975 the Commonwealth/State funded RICE project (Remote and Isolated Children's Exercise) has resulted in a diversified range of activities and services being brought to trackside communities on the 'Tea and Sugar'. Based at Port Augusta, four full-time and two part-time members of the RICE team work with isolated



nes the ‘Tea and Sugar’

children and families living along the Trans-Australian (and also Central Australia) railway.

The services provided by the ‘Tea and Sugar’ train do not, however, stop at material things. At least four return trips are made on it each year by Infant Health Sisters, travelling in a specially equipped self-contained Community Services Car, provided by AN. The car is also used for dental survey parties and by clergymen who minister to the spiritual welfare of those residing along the line, being so fitted out that it can be used by any denomination.

The RICE Project team which also use the Community Services car may include teachers, a community health nurse and volunteers from many organisations and departments for specific trips.

The range of activities in the Community Service car varies according to the personnel on board. Every month the RICE nurse and pre-school teacher are on board to offer medical advice and playgroup activities. Every second month an MBHA sister and a doctor from Flinders Medical Centre join the RICE team.

Others to have joined the team have included a YWCA worker conducting make-up sessions and activities for older children, a regional librarian who reads stories and performs puppet shows, personnel from Family Planning, a youth consultant from the Department of Community Welfare and persons involved in handicraft activities for parents and children.

Twice in the past two years a small theatre company has travelled on the Tea and Sugar, presenting live performances wherever an audience could be found — even if it was only a family or two. Sponsored by AN, it was a highly appreciated treat which can only be properly understood when it is realised that the people travelling on the ‘Tea and Sugar’ are the only contacts many railway families have with persons not directly concerned with the railways.

It is hardly surprising then that the train is welcomed at every stop.

Although the number of maintenance camps along the line has dwindled as modern methods of track renewal have been employed, the Tea and Sugar train will continue to be an important feature of life on the Nullarbor railway.

(continued on page 29)

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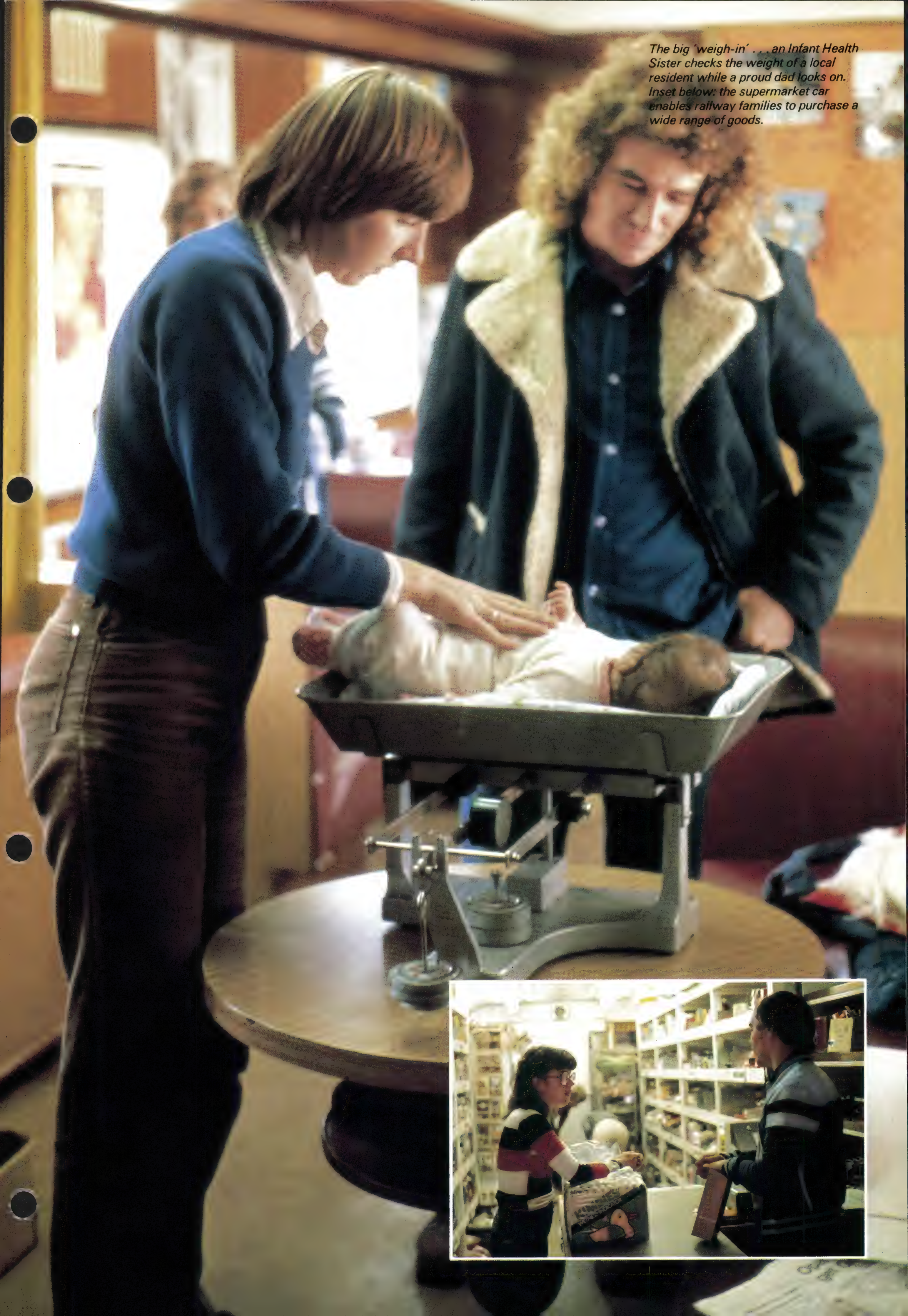
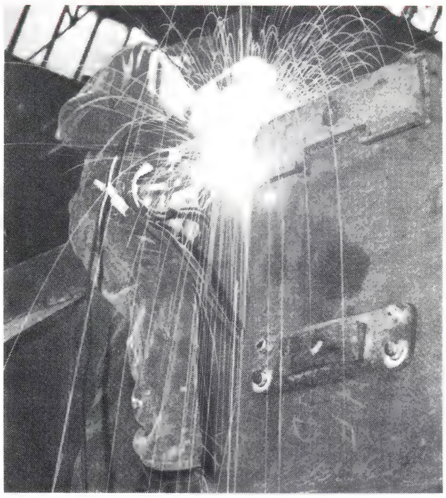


The big 'weigh-in' . . . an Infant Health Sister checks the weight of a local resident while a proud dad looks on. Inset below: the supermarket car enables railway families to purchase a wide range of goods.

Westrail

Midland workshops complex a major nerve centre for Westrail



Welder working on heavy structural components.

Westrail's Midland Workshops is one of the major nerve centres of the Western Australian railway network. It has carried the onerous task of building and maintaining the larger part of Westrail's rolling stock fleet since its birth shortly after the turn of the century.

One of the largest heavy engineering plants in Western Australia, Midland employs a staff of approximately 2300, including nearly 500 young apprentices.

This huge complex is situated on 68 hectares of land close to Midland town centre. The workshop buildings themselves occupy nearly 11 hectares.

Originally, the Western Australian Government Railways maintenance workshops were at Fremantle. As the rail system rapidly grew, towards the end of the last century, the original works became too small to handle the work load.

The Midland Workshops were opened in 1904 and the original buildings still form the largest part of the complex. Since its earliest days, the construction of freight wagons has been a major task.

During the first World War the rebuilding of steam locomotives was undertaken, and this continued intermittently until the second World War.

Passenger vehicles also were built at Midland, both for the W.A.G.R. and the Midland Railway (later absorbed).

During the second World War Midland became a major part of the Australian war effort. Steam propulsion units for naval vessels and ships propellers were constructed.

The workshops manufactured 25-pound artillery shells and produced tooling for other armament manufacturers.

The largest locomotives produced at Midland were the Australian Standard Garrett, a collaborative design and manufacturing effort between the Australian rail systems. The last steam locomotive manufactured at Midland was the 'S' Class in 1949. These locomotives were also designed at the Workshops.

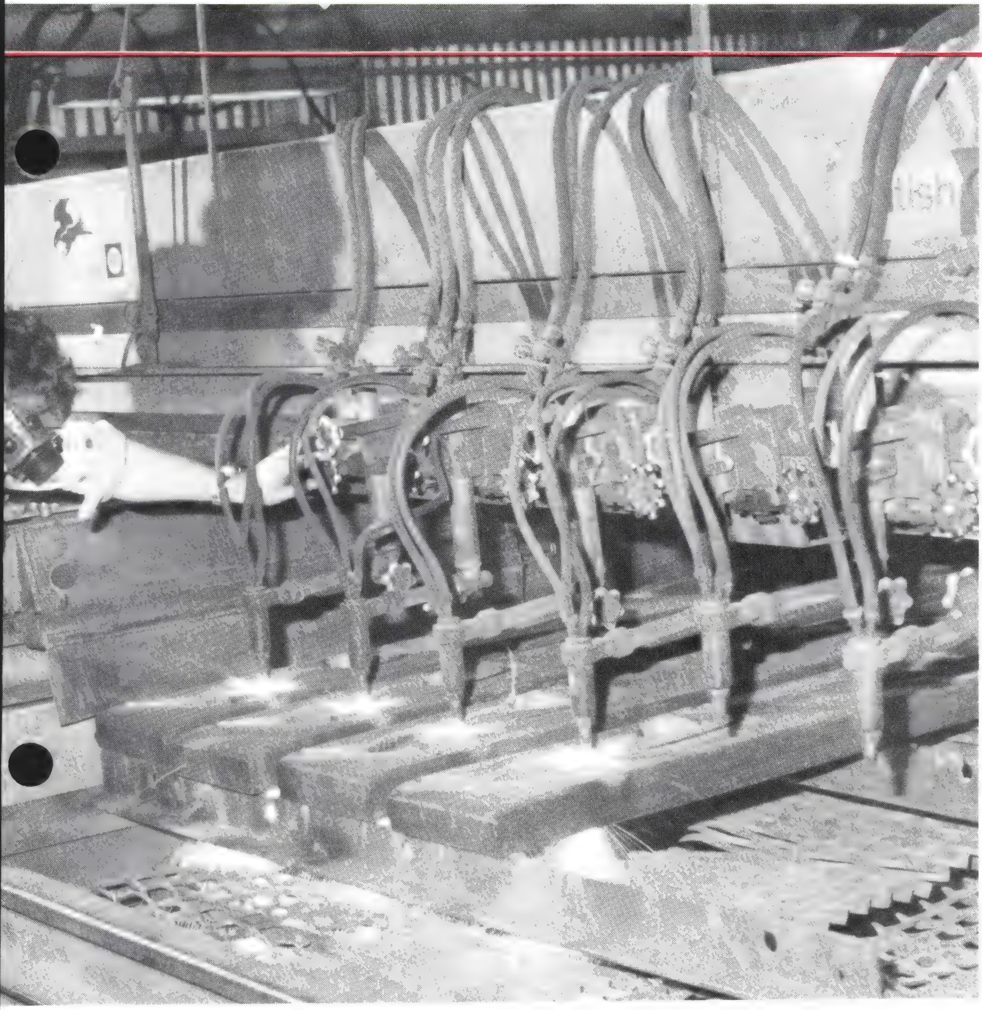
Multiple head profile cutter fashions major structura

In more recent years, specialised wagons for the haulage of bulk commodities have become an important function of the workshops, along with the maintenance and general overhaul of Westrail's fleet of diesel-electric locomotives.

Each year approximately thirty-five locomotives are given general overhauls, along with some seven hundred freight wagons. Between seventy and eighty new wagons are constructed, many for private companies.

Twenty-two different trades are represented at Midland, making up a formidable list of technical expertise. Many of the traditional names of the individual workshops have been maintained. A walk through them gives a fascinating insight into the enormous scale and variety of work undertaken.

The major overhaul of steel and aluminium wagons is undertaken in the Rolling Stock — Metal Shop. This includes the fitting of draw-gear, brakes, airlines and under-gear. Next



apes of parts prior to more precision machining or welding.

door in Rolling Stock — Timber, passenger vehicles receive major body maintenance.

The Woodmill is a huge timber processing plant. Wood is cut, planed and routed for use not only at Midland but for the whole Westrail system. The Boiler Shop is the site for the manufacture of new wagons in both steel and aluminium. Vehicles damaged in service are re-built, whilst alongside, structural steelwork is fabricated for bridge spans or turntables.

The Blacksmiths Shop manufactures a host of components and sub-assemblies, both for use at Midland and elsewhere.

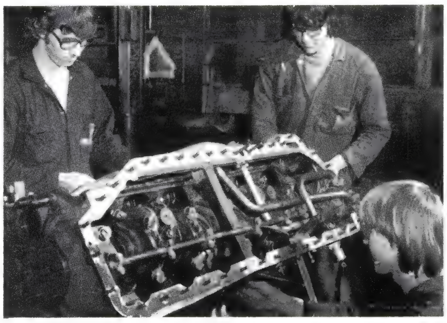
This is also the shop in which dog spikes are forged for track construction, and springs for vehicle suspensions. Behind is the Flanging Shop, where huge pressings are made for tank wagons. Enormous sheets of aluminium are rolled and shaped into complex jigs from which specialised wagons take shape.

Across in the Machine Shop, row upon row of lathes, milling machines, planers and borers fashion precision components for a multitude of applications. A huge wheel lathe reprofiles worn wheels without removing them from their axles. The tool room makes complex tools and gauges for use throughout the workshops. The overhaul and rebuilding of locomotives is undertaken in the Fitting Shop. Bogies are stripped of their traction motors and the gigantic diesel motors are removed to the Diesel Shop for overhaul.

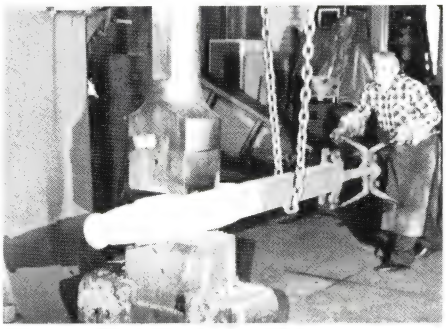
Gleaming new vehicles emerge from the Paint Shop, complete with complex numbering and signwriting. The Trimming Shop re-upholsters seats in passenger cars, whilst the Fiberglass Shop turns out vehicle panels, hatches and other g.r.p. components. The Electrical Shop prepares the intricate components needed for modern rail vehicles, including delicate instruments, whilst comprehensive metal plating work is undertaken nearby.

The Power House supplies thousands of cubic metres of compressed air to drive the multitude of complex machine tools from a building which once supplied electrical power for the whole complex. Alongside, the Copper Shop fashions piping assemblies for the hydraulic and vacuum systems of contemporary rail vehicles. The Pattern Shop and Foundry work hand-in-hand producing timber patterns which form the moulds for subsequent castings in steel, brass and aluminium.

Aerial view of the Midland Workshops.



Apprentices work on a diesel engine.



Blacksmith shop produces a host of components and sub assemblies.

No description of the Midland Workshops would be complete without mention of the Apprentice School.

Each year over one hundred apprentices are employed at Midland in a multitude of trades. The Apprentice School teaches basic skills in hand tools to young apprentices before they join the main workforce. Westrail, however, places great emphasis on the training of apprentices in the real workplace. Westrail apprentices are known to employers Statewide as having received the finest of training in their respective trades, and are eagerly sought after for their skills.

The Midland workshops has a proud tradition, but nothing remains constant. Many aspects are currently being re-organised to maximise production and take advantage of technological innovation.

The current re-organisation will be complete in 1984 and will assist in maintaining the Midland Workshops as one of the major nerve centres of the Westrail system.

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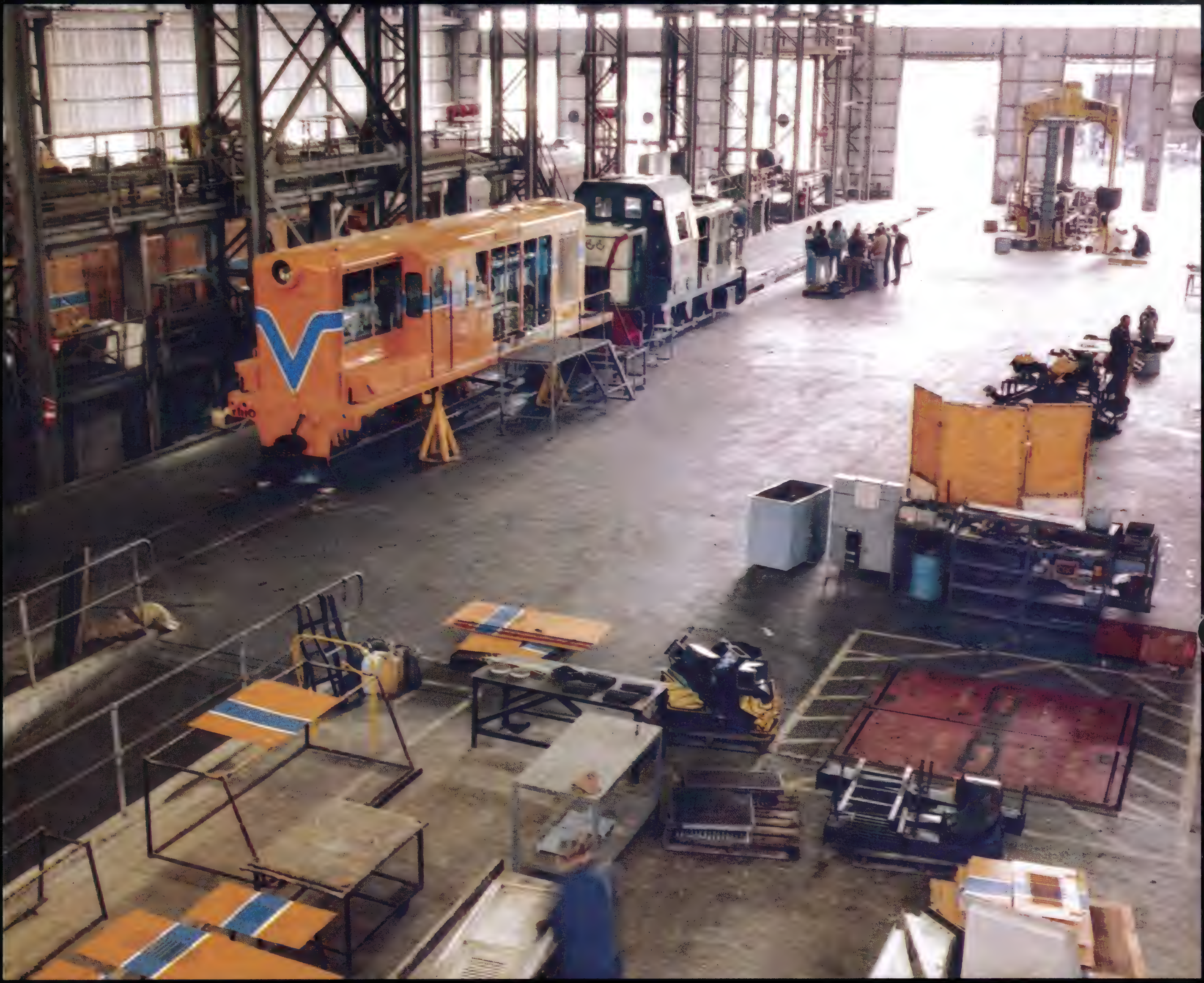
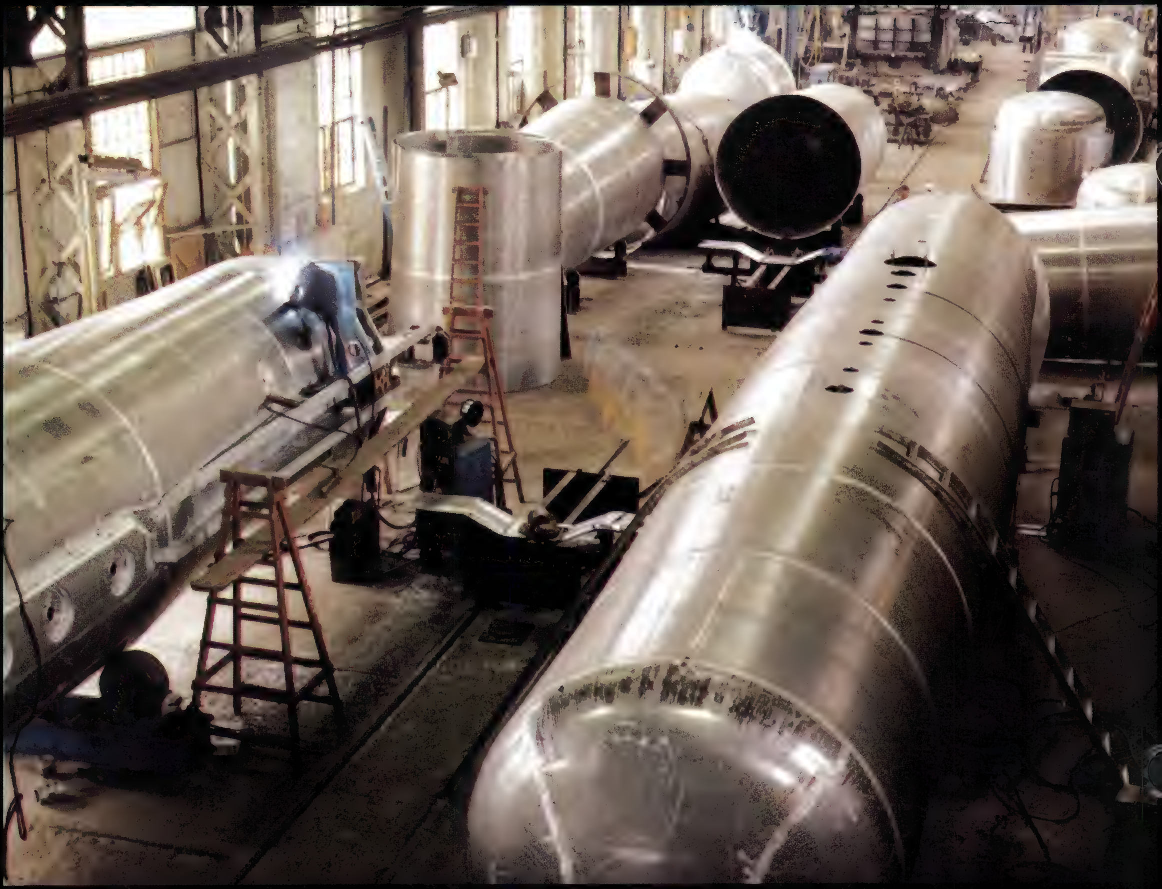


Above: each year approximately thirty-five locomotives are given general overhauls at Westrail's Midland Workshops.

Opposite: enormous specialised tank wagons made from aluminium are constructed in the Midland complex, many of them for private companies.



Victorian views resplendent by rail

Train lovers will find that getting around Victoria on rails is easy and fun.

Victoria has much of the scenic variety of Australia all within a day's ride of Melbourne, and there are packages available that enable train travellers to take a day return or trips lasting from a weekend to eight days.

Victoria's wineries are becoming increasingly popular, and feature on several trips run by VicRail with private operators.

One is the 'Rutherglen Red' tour that takes young at heart passengers on a fun-filled weekend to many of the wineries in the Rutherglen district of north-east Victoria.

An early morning Saturday start from Spencer Street Station in Melbourne includes champagne and sandwiches followed by a mid-morning snack. At lunch, chilled Rutherglen wines and more sandwiches are served aboard the train, which is equipped with a special dance car (mobile disco and DJ at one end) for singalongs to continue for the whole morning journey.

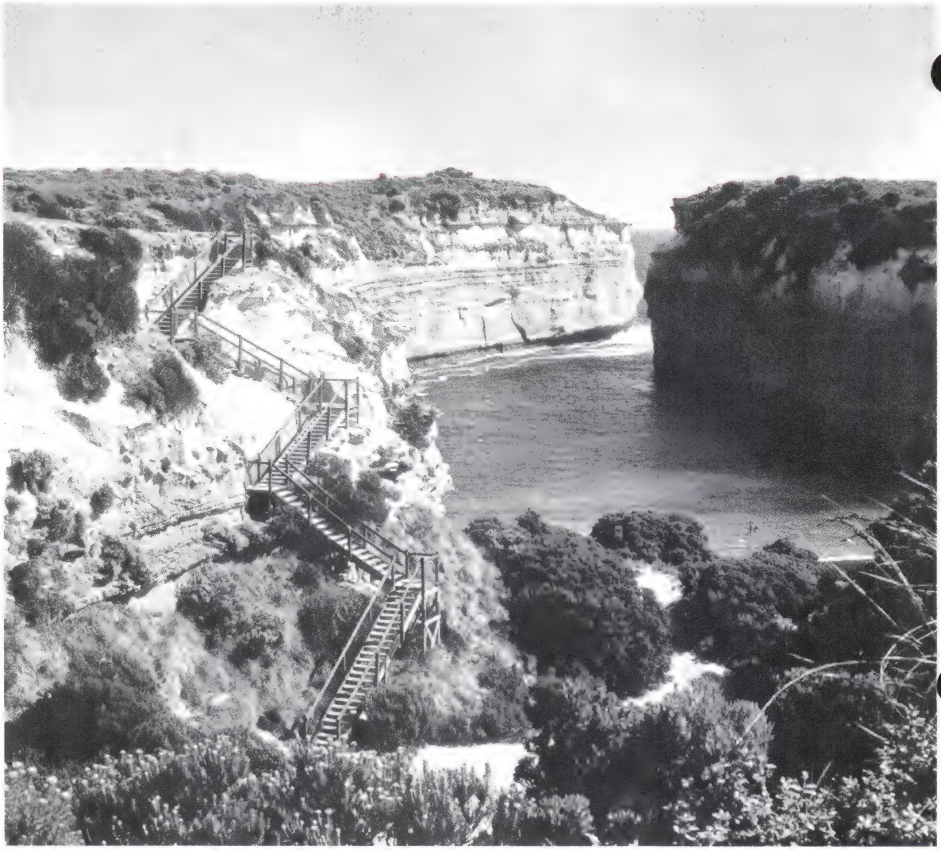
Travellers visit wineries by coach and can enjoy a dinner-dance at an Albury motel. Sunday morning features a scenic tour by coach, with lunch at an old homestead in a vineyard. The return train trip has more dancing, a jam session for budding musicians,

Melbourne's famous Puffing Billy puffs its way along a 13 kilometre Scenic Route from Belgrave in the Dandenong Ranges to the beautiful Emerald Lakes Reserve.

(continued from page 33)

plus wine tasting and arrives in Melbourne early on Sunday night.
The 'Swan Hill Spirit' is a similar train journey, from Melbourne to a Murray River wine centre near Swan Hill and includes a visit to one of the most unusual sound and light shows in the world at the Swan Hill Pioneer Settlement. The Settlement is a major tourist attraction with exhibits that highlight the ingenuity and versatility of Australia's inland pioneers.
The Murray River forms Victoria's northern border, and features in a number of VicRail tours, including a Mildura weekend where you are accommodated, have breakfast and dinner provided, but otherwise your time is your own. Or you can join a completely organised 7-day 'Mildura Bonanza' package.

You can leave Melbourne aboard The Vinelander train for an overnight journey to Mildura, and next day enjoy tours of the Working Man's Club where you'll find the longest bar in the world, cruise the Murray River aboard a paddle steamer, sample wines at Mildara Winery and visit historic Tyntyndyer Homestead which was built in 1846 and has been classified by the National Trust.
Fanned by Antarctic winds the great rolling waves of the mighty Southern Ocean have crashed ashore on Victoria's south west coastline for centuries, carving the coast into majestic scenery including the 12 Apostles, Loch Ard Gorge and London Bridge.
This spectacular Port Campbell coastal scenery can be seen on VicRail tours like the 'Five Day Warrnambool' which includes Tower Hill and the rich pasturelands of the Western District.
As well, VicRail's seven-day 'Mildura Magic Carpet' travels through the beautiful Otway Ranges, Port Campbell National Park, Tower Hill reserve and the historic towns of Port Fairy, Portland and Mt. Gambier before the coach turns north.
Now you'll see the Grampians, enjoy mountain walks, waterfalls and unique wildflowers. The journey continues to the nature-lovers paradise misnamed 'the Little Desert', and through the Mallee before arriving in Mildura. The return to Melbourne is overnight aboard The Vinelander.
The Little Desert can also be explored on a four or five-day VicRail package.
A five-day VicRail Gippsland Lakes tour offers a four hour cruise around Lake Victoria, scenic touring by coach, including Bairnsdale, with its St. Mary's Church murals, a winery, a picnic among the kangaroos in Buchan Park and a guided tour of the Buchan Caves.



See Loch Ard Gorge carved by the crashing waves of the mighty Southern Ocean.

Steam Trains. Steam train enthusiasts may enjoy some of the tours run by Steamrail Victoria. Steamrail Victoria is a voluntary non-profit organisation that co-ordinates the efforts of major railway historical and enthusiasts' societies. It runs chartered trains or people can join a scheduled vintage train with its steam engine which visits places of historic or tourist interest once a month (March to December).

For instance, visits to Ballarat (Sovereign Hill Goldmining Township) and Point Cook (Air Force Museum or Werribee Park) are scheduled for May, and in June the vintage train visits Seymour (Mitchelton Winery or the Seymour Tank Museum).
These trips are by steam locomotives wherever possible, subject to summer fire bans and availability of steam locomotives.
People who like steam locomotives may also ride into the past by steam train on the Bellarine Peninsula museum railway, built and operated by the Geelong Steam Preservation Society. Trains run from Queenscliff station around the shores of Swan Bay and Laker's Siding or over the Bellarine Peninsula hills to Drysdale every Sunday and on public holidays.
Perhaps Melbourne's most famous train is Puffing Billy which has delighted generations of children, and their parents also enjoy riding in the style of travel experienced by Australia's early settlers. The narrow gauge train puffs its way along a scenic 13 kilometre route through the Dandenong Ranges from Belgrave to a terminus at lakeside in the beautiful Emerald Lakes Reserve where you can relax, swim, or go bushwalking for a few hours before making the return trip of about one hour.
Visitors to Melbourne may also include the North Williamstown Railway Museum in their itinerary to see about 19 locomotives, carriages, wagons and other railway equipment. The museum is operated by the Australian Railway Historical Society and is open on weekends and most public holidays.

Interstate rail links. From Adelaide you can get to Melbourne on 'The Overland' which has air conditioned sleeping cabins and carriages, a cafeteria car, and a club car for first class passengers.
From Sydney there is a choice of nightly travel on either the 'Southern Aurora' or the 'Spirit of Progress' or you can watch the countryside roll past the big picture windows on the 'Intercapital Daylight'.

Restoration work on schedule

Some years ago, USA world rail authority, David P. Morgan, when referring to Sydney Central Station in an article in 'Trains' said:

"Central Station impresses a Londoner; it astounds an American!"
If Mr Morgan was to visit Sydney Central Station again, he would be even more impressed and astounded following the recent $2 million-plus restoration programme!

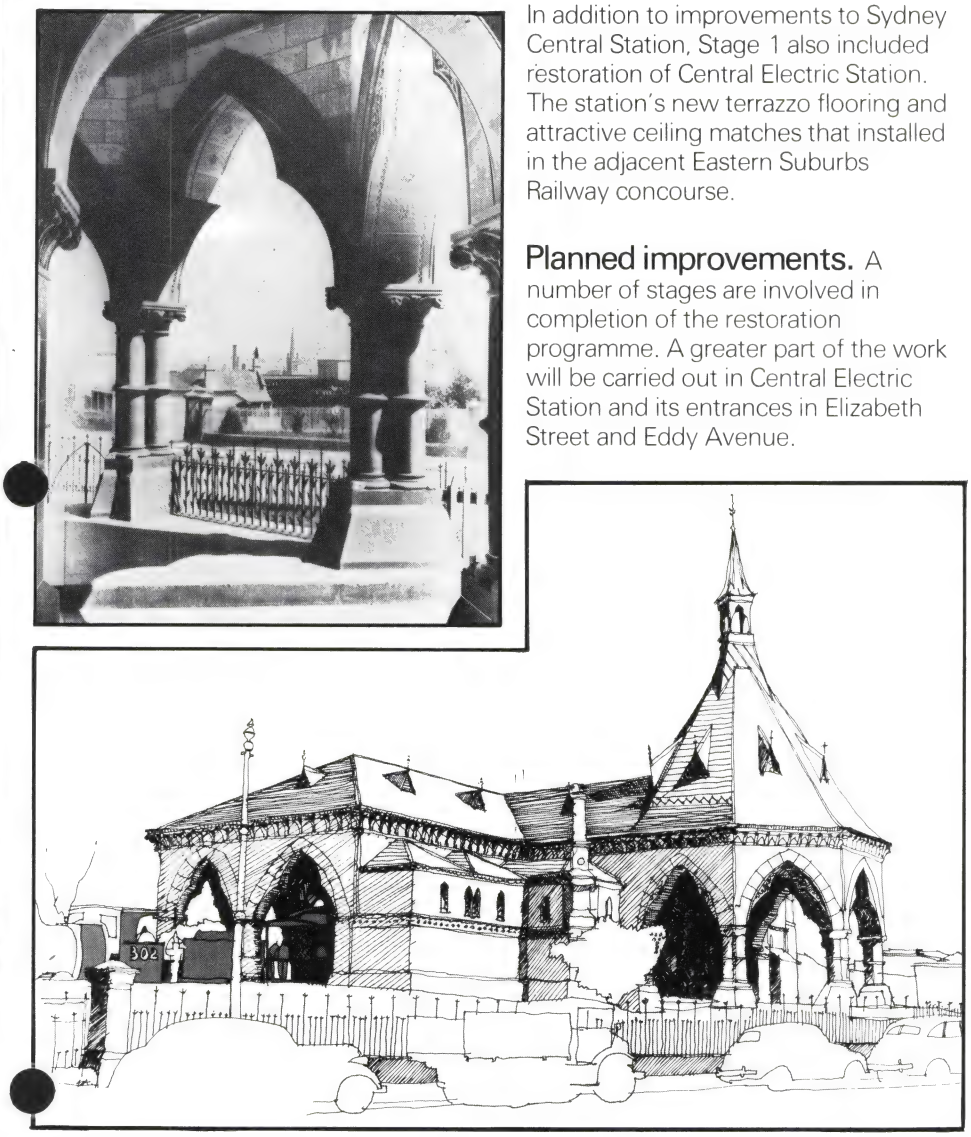
After 75 years of operation, Sydney Station celebrated the opening of Stage 1 of the restoration programme last year.

The main concourse area of the station has been modernised by:

- Paving the extensive floor areas with terrazzo tiles.
- Erection of attractive screen barriers between the ends of platforms and the concourse and installation of automatic sliding doors at the eastern and western ends of the concourse to exclude draughts.
- Replacement of old seats with colourful stylised seating and provision of landscaped planter boxes.
- Installation of bright and functional lighting.
- Replacement of the impressive domed roof and painting of the unusual steel arches.
- Relocating and rebuilding kiosks and other concessions.
- Existing toilets have been refurbished.
- Ramps have been installed for the disabled and raised platform numbers supplied to assist the blind.

In addition to improvements to Sydney Central Station, Stage 1 also included restoration of Central Electric Station. The station's new terrazzo flooring and attractive ceiling matches that installed in the adjacent Eastern Suburbs Railway concourse.

Planned improvements. A number of stages are involved in completion of the restoration programme. A greater part of the work will be carried out in Central Electric Station and its entrances in Elizabeth Street and Eddy Avenue.



Mortuary Siding near Sydney Central Station is soon to be restored to its former elegance by the State Rail Authority. Inset: A section of the ornate carved arches in Italian Gothic style.

This includes:

- Resurfacing of pedestrian tunnels and stairs leading to electric platforms.
- Refurbishing of existing toilets.
- New wall tiling in the concourse.
- Upgrading and rationalising concessions on Eddy Avenue and Elizabeth Street ramps.
- New furniture for platforms.
- Resurfacing of Eddy Avenue ramp and landscape surroundings.

In the concourse area of Sydney Central Station, work still to be undertaken includes:

- Provision of a modern train arrival and departure indicator.
- Family recreation room on the main concourse.
- The existing unused Interstate Booking Office, with its distinctive and historic floor and wall murals will be converted into an elegant waiting lounge with bar.

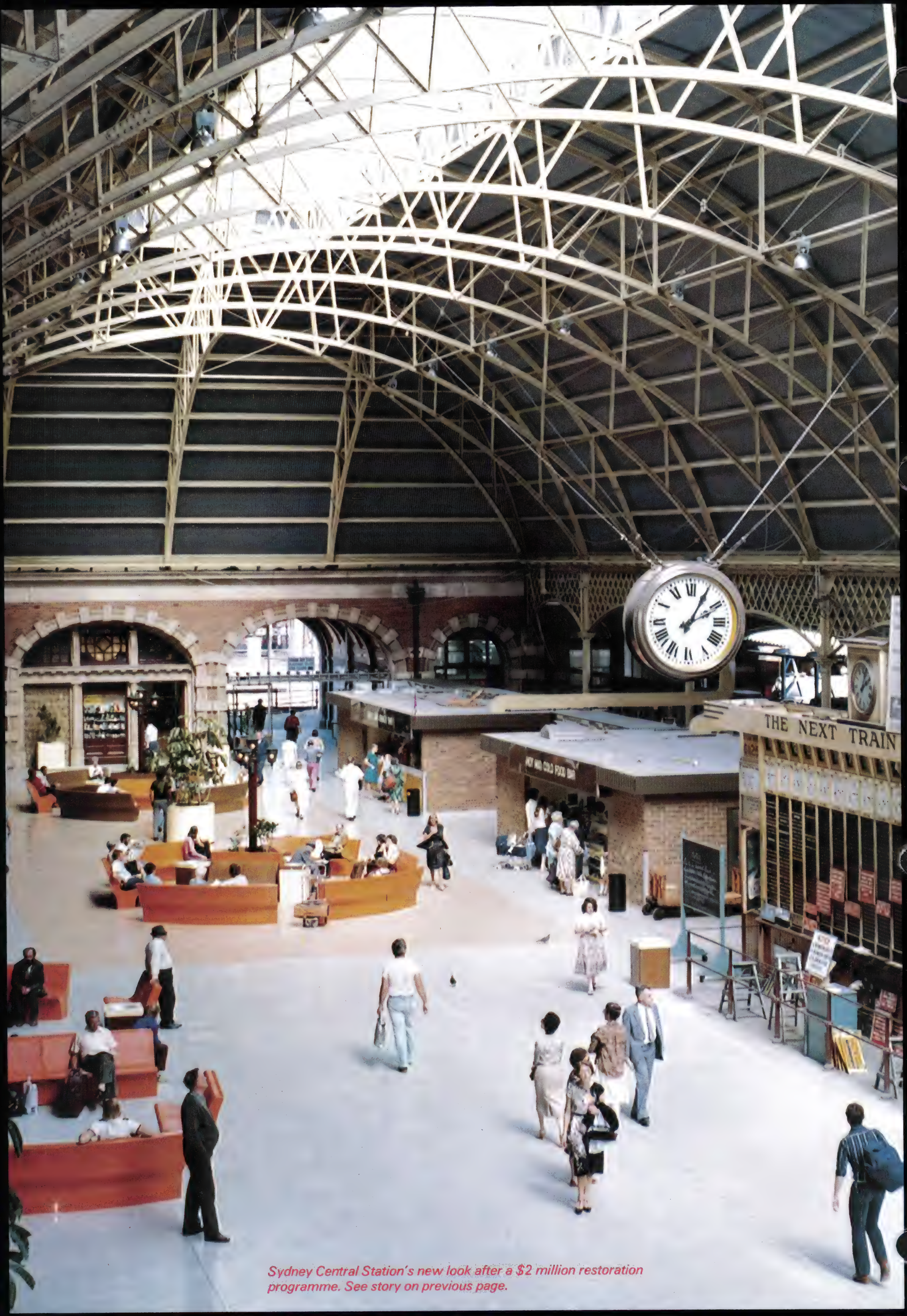
'New Life' for Mortuary Siding.

Another historic building in close proximity to Sydney Central Station — Mortuary Siding — is also to be restored to its former glory and elegance.

Consultants have been engaged to design, document and make recommedations on the restoration works considered necessary.
It is anticipated that tenders for the restorative work will be called in July 1982, with completion planned within 9-12 months.

Mortuary Station was designed by the then Colonial Architect James Barnet and was known as the 'Regent Street Receiving House' or 'Necropolis Receiving Station'. The building was used for funeral trains to Rookwood Cemetery from 1869 and to Woronota Cemetery from 1900.

It continued in use until 1938 when motor hearses became the accepted method of conveying caskets to cemeteries. Trains continued to operate for mourners until 1948.
With its magnificent Italian Gothic sandstone and ornate carved arches Mortuary Station is a part of Sydney's past which will thankfully be preserved for posterity.



Sydney Central Station's new look after a $2 million restoration programme. See story on previous page.

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SRA reports big passenger increase

Over the past six months seven million more passengers travelled by rail in New South Wales compared with the same period in the 1980/81 fiscal year.

The number of passengers between July and January was 109,861,000 compared with 102,628,000 for the same period last year according to the State Rail Authority of N.S.W.
The railways now carry around 15 million passengers a month compared with 14 million 12 months ago.

This means more than one million extra passengers a month are now travelling by train than was the case a year ago.
The Minister for Transport, Mr. Peter Cox, said the railways were thrilled and delighted with the increase.

"The figures confirm that the recent revival of N.S.W. Railways is being sustained," he said. "They also show that we are one of the fastest growing major industries in Australia".

Mr Cox said the railways are anxious to win over some of the passengers priced away from airlines and that the XPT could not have come at a better time.

Figures for the financial year ending June 30, 1981, showed a major growth in rail passengers. During the year an estimated 212,910,000 passengers used New South Wales railways compared with 209,691,000 in the year ending June 30, 1980.

This growth has followed a serious decline in rail passengers through the 1970s.

In the last six months 107.7 million suburban and interurban passengers were carried. This was 6.3 million or 6.2% more than in the same period last year.

Country and interstate travel also increased by 130,000 or 5% in this period.

Mr Cox said he believed that the huge investment in railway upgrading had played an important part in this revival. Obviously, petrol prices had been a significant influencing factor. However the sustained improvement in New South Wales has been far greater than in any other State in Australia.

New South Wales railways now carry 30M more passengers a year than was the case five years ago. No other State in Australia has registered such increases. Comparative passenger figures are:

	Passengers in Millions 1981	1976
New South Wales	212.2	180
Queensland	31.9	34.3
South Australia	(1980) 12.5	12.4
Victoria	86.8	110
Western Australia	(1980) 9.3	9.3

(Interstate travel not included)

Mr Cox attributed these continuing increases in New South Wales train travel to new double-deck suburban and interurban rolling stock and the upgrading of country rolling stock; massively improved on-time running; new signalling systems and track upgraded; upgraded station buildings; duplication and quadruplication of track sections previously causing bottlenecks; a sensible fare policy; a drive on fare evaders.

The increased ticket sales have occurred over all major line sections throughout the Metropolitan and interurban network and on many major country line sections.

Mr Cox said the S.R.A. was fully aware that it still had a long way to go in improving its train performance and in replacing old railway stock.

He said industrial disruption also had discouraged the growth in passengers and this was a continued headache for the S.R.A.

"At least we are driving forward at an exciting pace," he said. "Not many Australian industries can say that in the current economic climate."

Fare evasion. Mr Cox said that the fare evasion campaign over the last twelve months has been very successful and has resulted in a marked reduction in fare evasion by train travellers. In addition it has been responsible for the collection of an extra $3 million revenue. Prior to this fare evasion campaign it was estimated that 3.7% of all rail passengers were evading fares. This has been reduced to 0.65%

Mr Cox said N.S.W. Railways were booming today with more commuters, country and interstate travellers and bigger mineral and grain trains.

The following table sets out the growth in ticket sales on major lines in the last six months:

Line Section	Ord. Tickets % Inc.	Wkly. Tickets % Inc.
City Circle	2.3	21.7
Redfern — Strathfield	8.0	14.7
Homebush — Clyde	9.6	3.4
Rosehill — Carlingford	6.3	2.8
Berala — Carramar	7.2	4.2
Granville — Canley Vale	10.9	4.9
Cabramatta — Campbelltown	17.1	14.5
Menangle — Mossvale	1.5	15.5
Erskineville — Sydenham	3.9	19.7
Marrickville — Birrong	6.2	7.0
Turrella — East Hills	3.0	2.8
Tempe — Sutherland	7.4	9.5
Kirrawee — Cronulla	10.6	9.7
Loftus — Otford	14.3	15.5
Stanwell Park — Wollongong	10.4	26.6
Coniston — Kiama	4.0	44.4
Martin Place — Bondi Junction	−0.6	20.4
Harris Park — Blacktown	15.0	5.9
Marayong — Richmond	11.6	6.4
Doonside — Penrith	19.7	19.4
Emu Plains — Lithgow	15.3	12.5
Milsons Point — Waitara	4.8	11.9
North Strathfield — Hornsby	13.9	8.2
Asquith — Cowan	23.4	6.9
Hawkesbury River — Wyee	15.4	11.8
Total Sydney Suburban & Interurban	7.0	11.7

Ghan travellers increase is remarkable

To test the market for additional Ghan passenger trains to Alice Springs, Australian National is operating a second weekly service from Adelaide for a three month trial period which started in May.

It's a sure sign that the famous Ghan legend lives on into a new era.

With the demise of the famous old narrow gauge passenger train to Alice Springs in 1980, many people assumed an era rich in history and folklore had passed away, to be forgotten.

But no! The new Ghan, operating on its modern all-weather track via Tarcoola, is establishing new standards of reliability. It is proving every bit as popular with tourists and travellers by keeping alive the old tradition of comfort and friendly service.

Gone are the ornate old carriages and their slow, bumpy 2½ day journey over a track ravaged by heat, sand and floods. Instead it's a fast 110km/hour trip taking just 24 hours, with full dining, sleeping and motorail facilities.

The current Ghan passenger figures show a remarkable increase since the opening of the new railway. Despite the fact that the new Ghan carries 320 passengers, more than twice the number of the old, it has proved so popular that it is frequently booked out.

AN has been under considerable pressure for some time to increase the frequency, and over the last Christmas-New Year period a second train was successfully operated.

Thus, with the popular winter tourist season approaching, an ideal opportunity presented itself to test the market.

The extra service departs Adelaide on Sundays and returns from Alice Springs on Mondays. It follows a similar timetable to the current Ghan which leaves Adelaide at 10.30am on Thursdays and Alice Springs at 3.30pm on Fridays.

The extra train consists of first class sleepers and economy sitting accommodation, and includes a motorail facility.

Several package tours incorporating the new Ghan operate to Central Australia, taking advantage of this fully airconditioned modern train with world-class facilities. Roomette (single) and twinette (double) sleeping compartments which are provided for all first class passengers feature folding tables, reading lights, wardrobe, hot and cold water, washbasin and toilet facilities. Twinettes each have their own showers, while roomettes have showers at the end of the carriage.

A luxuriously appointed club/lounge car provides a full drink service in ample space for relaxation.

Three and four course meals are provided in the dining car for all sleeping car passengers, while light refreshments are available to economy class passengers in the cafeteria/lounge car.

On looking back it's rather surprising that the old Ghan earned such a famous name. It only ran for 50 years, and was noted for its slow speed and unreliability because of the nature of the country which it passed.

The first Ghan ran to Alice Springs in 1929 when the narrow gauge railway was finally completed from Port Augusta to Alice Springs via Quorn, Marree and Oodnadatta. The name had been unofficially used for the fortnightly passenger train to Oodnadatta in earlier years, having been derived from the hardy Afghans whose camel trains had ferried passengers and freight northwards from Oodnadatta during the 40 years that the railhead had stopped at that town.

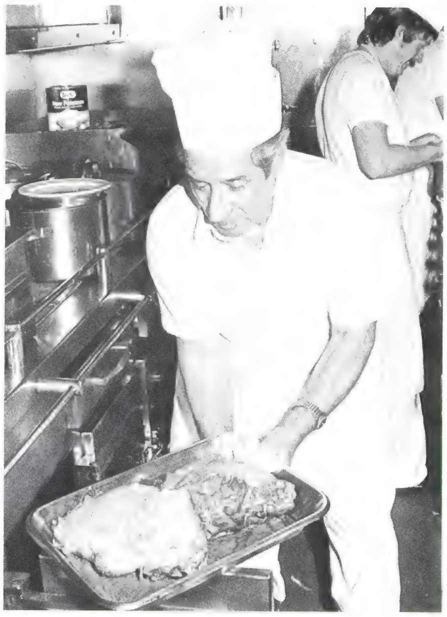
Lightly laid through very harsh country, the track crossed the flood prone Eyre Basin, with resultant difficulties and irregularity in operation of the line.

On several occasions major bridges were swept away by the floods which, although infrequent, are often severe in this region.

Thankfully, those days passed with the opening of the new line in 1980.

Looking ahead, the opening of the standard gauge railway from Adelaide to Port Pirie in December will provide yet another boost for the Ghan by eliminating the inconvenient change of trains at Port Pirie and thus speeding the service.

It all adds up to the Ghan being a living legend.



Fine food is a specialty on the Tarcoola/Alice Springs run.

The old Ghan . . . not 'noted for its speed and reliability

The Treated Wood Formula for Railway Sleepers has been proven Overseas

From data published by the American RTA Marketing Research Committee –

Total Sleepers in service 1980	Replacement percentage 1980
813,899,108	2.89%

These figures are typical of the previous 6 years and cover the total United States where treated sleepers are used almost exclusively. They indicate a life service in excess of 30 years from this product.

Australian findings could even surpass these

The use of commercially treated wood sleepers commenced in earnest in Australia 10 years ago. The total now in service exceeds 3.5 million.

Evaluation of their performance indicates zero replacements to date and an average life expectancy of 40 years based on probability projections.

The performance of treated sleepers in Australia will emulate the American experience; few things can be as certain.

The treatment methods used are comparable and even the so-called 'secondary' eucalypt species used here are stronger and more naturally durable than the American counterparts. In addition, they receive the benefit of internal sterilisation and improved stability unique to the 'Boulton type' preservative method exclusive to Australia.

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Perishables . . . a delicate freight

Queensland's Railway Commissioner and Chairman of the Railways of Australia Committee, Mr P. J. Goldston, recently addressed a convention of the Australian United Fresh Fruit and Vegetable Growers Association which was held in Sydney.

The topic of Mr Goldston's address was a subject of vital interest to his listeners: Railways of Australia transport of fresh fruit and vegetables from Queensland to the southern States both with and without temperature control. His comments offer an interesting insight to the way in which Railways of Australia is approaching with flexibility the task of handling perishable freight.

Mr P. J. Goldston

Traditionally, Queensland has been a major rail supplier of fruit to the southern markets of Sydney, Newcastle, Melbourne and Adelaide. Fresh fruit and vegetables are very delicate living tissues that are easily damaged.

One of the main ways produce is damaged is through impact and vibration, both occurring in transport vehicles. The severity of these problems is reduced in rail transport. The main fruit/vegetable growing areas in Queensland are the Atherton Tableland, the area Townsville north to Innisfail, the Bowen and Home Hill areas, the Yeppoon and Yarwun areas near Rockhampton, the Gayndah and Mundubbera area, the Pialba Branch, Bundaberg to Caboolture on the north coast line, the Granite Belt near Stanthorpe and the Lockyer Valley.

Watermelons, potatoes, pumpkins, avocadoes come from the Atherton Tableland; bananas, pineapples, watermelons, pumpkins are grown north of Townsville to Innisfail; tomatoes, mangoes, capsicum, cucumbers, egg fruit, marrows, rockmelons and zucchini come from the Bowen area; pineapples from Yeppoon; pawpaws, mangoes, marrows, grapes, zucchinis, pumpkins, citrus from the Gayndah, Mundubbera area; pineapples, citrus, beans, zucchini originate from Bundaberg to Caboolture, whilst stone fruit, apples, pears, grapes, celery and vegetables are grown in the Granite Belt.

Ordinary louvred wagons were used for transport of fruit and 'CMIS' iced wagons provided the nucleus of our cold wagon fleet and were supplemented by a mechanically refrigerated 'CMR' wagon.

Consequently prior to November, 1977, all fruit from Queensland for interstate markets had to be hand transhipped at Clapham.

For years 'CMIS' requirements were iced at Townsville by this Department and costs passed on to the Consignor. Later an arrangement was negotiated whereby Tropical Ice at Townsville and Port Curtis Dairy Co-op Association at Mackay iced these wagons. In November, 1977, thirty (30) wagons ('R' wagons) came on stream in Queensland and this wagon could convey twenty (20) pallets. A Thermo-King refrigeration unit serviced the wagon which proved popular within Queensland.

However, all of these wagons necessitated tranship of contents at Clapham. The extra handling caused some damage to the valuable product as well as time and labour spent on unloading, loading and stacking at Clapham which proved expensive and difficult to organise properly. This arrangement was never regarded as totally satisfactory and at times in the peak of the fruit season resulted in fruit and vegetables not always meeting the targeted transit time.

In 1976 following acquisition of a number of containers by the then Public Transport Commission of New South Wales, it was decided to introduce a door to door container service for clients which would be known as the RACE concept (Railways of Australia Container Express).

It became evident that the ventilated type of RACE container would be eminently suitable for the conveyance of fruit from North Queensland to interstate markets. The main thrust of the idea was to streamline loading procedures by positioning containers at the farm or allowing the container to be loaded while still on the wagon, but more importantly to reduce the transfer time at Clapham, by crane transfer of the containers rather than manual transfer of individual packages.

The VC container, designed basically to International Standards Organisation specifications was modified by the Public Transport Commission of New South Wales to accommodate two Australian standard pallets side by side

Loading pallets of tomatoes at Bowen.

allowing ten pallets to be placed on the floor and stacked two high with a capacity of seventeen tonnes nett weight. The container is designed with doors on both sides and one end in contrast to the normal shipping box which allows only one end access. Its dimensions are 20ft long 8'8½" high and 8'2½" wide.

The Queensland Railways in assessing the value of containerising fruit was also conscious of some of the cost factors associated with such a move but decided that in the best interest of the rail customer this cost would have to be absorbed. Most of the cost amounting to $400,000 was connected with re-construction and modification of bridges on the main Brisbane — Townsville — Cairns trunk route in order that RACE containers on flat wagons could be accommodated. Accordingly, on Monday 21st November, 1977, the first VC RACE container was loaded from Bowen with Interstate fruit and was an immediate success.

In the short period between 22nd November and the end of December, 1977, two hundred and twenty-eight (228) VC containers were loaded with fruit from Central and North Queensland to Interstate Markets. Following a successful marketing of the concept at Bowen in 1978, there was a substantial diversion of fruit from louvred wagons to RACE containers from this area and during 1978 a total of 3,540 containers of fruit for a weight of approximately 23,000 tonnes was railed from the various Queensland stations to Interstate Markets. In 1979 there was a major downturn in railings in VC containers from the Bowen area due to a change to temperature controlled transport, but to offset this a major increase occurred in the Tully area, when 2089 VC RACE containers were forwarded to southern markets from growers in North Queensland from May to December that year. Watermelons made up a substantial quantity of this traffic. However, many VC RACE containers were damaged particularly by watermelons being loaded loose and 188 VC containers were repaired in our Ipswich Shops this year to help meet the growing demand. There was also some dissatisfaction with the VC ventilated containers as it was claimed they were too hot for the cartage of fruit and vegetables in the hot North Queensland summer, whereas in the cooler southern states the existing ventilation was satisfactory.

One container was modified to allow more air to circulate through the container and after three separate trial shipments for interstate proved to be partially more beneficial. In November 1979 the Railways Commissioners of Australia established a wagon control organisation which subsequently became known as 'CENWAG' to effectively monitor and control the movement of rollingstock on all intersystem routes. This organisation very early in its existence proved its worth and became a permanent part of the railway operations in Australia. It was subsequently decided that as from the 1st July, 1980, CENWAG would assume responsibility for the control and movement co-ordination of RACE containers on all systems. The Manager of the Cenwag organisation visited all railway systems prior to this event and instituted reporting procedures which involve daily advice to Cenwag indicating the number and whereabouts and status of all containers on individual systems. (i.e. whether loaded, empty or in transit etc.) The report also required that Cenwag be given reliable information as to forecast requirements both short and long term. It will be appreciated that a continual stream of VC containers from south to north during the fruit season had to be maintained. In the first year of control, viz. 1980, 2,854 VC containers were despatched from North Queensland representing the highest number handled for two years. In 1981, a total of 2,845 containers were railed from North Queensland for Interstate markets. Fruit traffic has always been considered by the rail systems as being in the priority class and accordingly the introduction of containers has required some re-scheduling of services between the various rail systems to allow for fast transit to markets in Sydney and Melbourne. Queensland operates three express goods services from Townsville each day, two morning and one evening in addition to an evening service from Cairns. This provides the producer an opportunity to load his commodity at the most suitable time. After pickups at various major locations such as Innisfail, Tully, Townsville, Home Hill, Bowen, Rockhampton, Yarwun, Gympie etc. trains arrive at Clapham late the following evening for the midnight and 5am express services to Sydney arriving at that location in time for the next day's market. Containers for Melbourne are forwarded by a connecting express service from Flemington Markets in Sydney arriving in Melbourne at 11pm the same night for the next morning market. The popularity and success of the RACE system in providing a fast, efficient and reliable means of transporting fruit from growers in Queensland to interstate markets is now so evident that purchase of additional RACE containers would seem inevitable, as it was not possible to meet the demands existing at the peak of the season for this type of transport. QR are also considering the purchase of 150 ventilated containers.

The development of handling systems, using palletised unitised loads is currently the most efficient method of improving handling of valuable produce and a greater demand is evident for refrigerated transport, particularly as fresh produce is generally pre-cooled thoroughly before loading. Many of the larger fruit growers have established on-farm cold storage and desire to load direct from the cold store to the refrigerated container. The Queensland Railways were conscious of this need and in association with the NSW Railways purchased 100 Refrigerated Containers in 1980. These containers are 7,620mm (25 foot) in length, have a 5.5 tonne tare and carry 14.8 tonnes with a floor capacity of two pallets wide by six pallets in length. The first 'SRC' container was loaded from Bowen on Tuesday, 17th June, 1980, for Flemington. These containers are serviced by a Thermo-King refrigerated unit whereby temperature can be controlled between − 29°C to + 20°C. These containers have proved very popular but I am afraid our requirement is more like 300 SRC than the 100 SRC now available to meet heavy seasonal demands. For the 1981 fruit season ex Bowen this Department was unable to meet the demands for this type of transport and it is expected that the same situation will apply this year. The demand for temperature controlled transport is increasing and for 1981 at the peak of the Bowen season we were transporting only slightly more than 50% of the traffic offering — the remainder going by road transport. Consequently a contract has been let for an additional 50 x 25 foot refrigerated containers and negotiations are underway for a further 50 of these containers. However, when new containers are purchased it is necessary to purchase an appropriate number of skeletal wagons to convey the container. A 25 ft. refrigerated container costs $42,217 each and suitable wagon approximately $33,000. The first of the new 50 refrigerated containers are expected to be delivered in May 1982, with deliveries of three containers every week, after testing the prototype. These containers are giving rail clients the advantage of refrigerated transport for fruit which must be temperature controlled. The demand for these units is so high that they too are monitored as individual units on a daily basis by Cenwag. The latter years have seen an extension of the fruit seasons once accepted as being from May to December.

Acacia Ridge is being developed by Queensland Railways as a major inter-system exchange terminal.

However bananas are being marketed for 12 months of the year with the height of the season July, August and September.

Tomatoes, mangoes and watermelons matured early last season.
In 1978/79 42,197 tonnes of fruit were railed to interstate markets and this figure has been increasing each year as 57,938 tonnes were railed interstate in 1980/81. For intrastate fruit 144,000 tonnes were handled 1980/81.
The output of the Bowen area for interstate markets for 1981 was equal to 2,936,903 ten kg packages which exceeded the 1977 record for combined road and rail conveyance. Breakup was: Rail 2,165,333 packages for hot and cold conveyance and Road 771,570 packages.

Acacia Ridge is being developed by QR as a major inter system exchange terminal. The major component of the yard is a six-hundred metre run, overhead gantry crane to service container traffic from both railway systems and road transport hauliers. There will be a number of standard and Queensland gauge roads for transhipping goods in other areas as well. This is stage one, being built at the initial cost of $15.3 million. Stage two of the facility, will duplicate the crane facilities and provide a marshalling complex, south of the existing yard. Expenditure at a similar level is expected.
The railway systems of Queensland, New South Wales and Victoria have an arrangement with the Committee of Direction of Fruit Marketing, Queensland, whereby the railways grant concessional rates in return for C.O.D. undertaking:

- to forward a certain minimum tonneage of fruit and vegetables by rail each year;
- to appoint 'C.O.D. loaders' at each despatch point;
- to arrange the loading and unloading of all consignments;
- to document all consignments and submit simple documentation to the Railways for each wagon;
- to accept all risks of transport;
- to be responsible for payment of all freight charges.

As far as New South Wales is concerned, there are two (2) main fruit and vegetable growing areas where rail transport is used. These areas are the Murrumbidgee Irrigation Area situated in southern New South Wales and the North Coast of New South Wales.
Fresh fruit and vegetables from the MIA are loaded in rail vans which have been specially constructed to create an air flow around the packages whilst the van is moving. It has a circulation effect on any cargo. Fresh fruit and vegetables are loaded in palletized form, in bulk bins, and also loose package state.
The main loading area is from Griffith. The train departs from Griffith each day, Monday to Saturday, with fruit and vegetables for the various markets. At Griffith there are several organisations better known as fruit packing houses that receive fruit and vegetables from the growers in bulk sales in packed or pre-packed form. The bulk fruit and vegetables are cleaned, sorted, graded and packed.
For this service a small charge is made to the growers and in addition, handling and transport charges. These fruit and vegetables packing houses have been in existence at Griffith for many years and most are private companies with the exception of one large growers' co-operative. Transport by rail from Griffith to the Sydney Markets is overnight arriving at the markets in the early hours of the morning in time for unloading and placing at the various agents stands for that day's sale.
The rail unloading area at the Sydney Markets is part of the Sydney fruit and vegetables market complex. From the North Coast Area of New South Wales, similar rail services exist with daily despatches of fruit and vegetables. The greater percentage of produce from the north coast of New South Wales is bananas and they are transported to markets at Newcastle, Sydney, Adelaide and Melbourne.
In Victoria, most of the fruit and vegetable traffic is carried by road. However, a new rail siding is being constructed at the Melbourne Markets, and when this is opened next year, it will obviate the necessity to carry fruit by road from North Dynon rail fruit siding to the markets.
We, in Queensland, are already planning for the future — and I am quite confident other States are thinking along similar lines, particularly on Australia's eastern seaboard.
In endeavouring to produce a better service to the Primary Producer and, in fact, to all rail users, the dominating problem is shortage of capital.
Let's look at basic capital costs, in round figures, a modern diesel locomotive costs A$1.2 to $1.3 million, skeletal wagons from $33,000, louvred vans $50,000 and the costs of modernising bridges, yards, signalling equipment, and workshops are on a similar scale. In the past most of this capital has come from Government sources.
From the Federal Budget we have seen only $70 million loaned to rail systems for national main line upgrading on a five year plan. This amount is interest bearing and repayable.
Contrast this amount with the $278 million to national roads in 1980-81 alone as an interest free and non repayable grant and you will see the parlous situation railways are in.

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Fast freight bogie with Pioneer Springs and Wear Plates as supplied to the New South Wales Public Transport Commission.

Pioneer supplies springs and wear plates for the fast freight bogies and locomotive suspension units that are used to transport goods and passengers over mainline tracks at speeds up to 125 km/hr. Pioneer's reputation for reliability has spread all over the world. Transport engineers everywhere rely on the consistent high quality of Pioneer springs for suspension units.

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Tom Hastie, a born railwayman

Tom Hastie was born a railwayman in a railway family. Uncle Jimmy was a driver on the South West Express in 1897 when two expresses ran between Bunbury and Perth.

Young Tom's first recollection of the railway was traumatic. He witnessed an accident at the Hennessey Road level crossing at Bunbury, then a small South West port, now a thriving city of Western Australia.

But despite that unfortunate experience, trains were a fascination to him, the smell of coal and the power of steam were enough to draw Tom to the railway tracks.

In 1915 Tom joined the Western Australian Government railways, as a cleaner, at the Bunbury Locomotive Depot on a wage of one pound nineteen shillings a fortnight.

The railway was busy in those times. It was not unusual to see ten sailing ships tied up at a time at the Bunbury jetty.

Freight trains mainly loaded with timber from the forest mills at Wellington, Wokalup and Gnanga Brook were common arrivals at the wharf.

After three years as a cleaner Tom climbed onto the footplate of a steam locomotive — for young Hastie it was like a dream come true.

Today, Tom, now 85-years-old, can still recall his first maiden journey on an "F" class locomotive from Bunbury to Bridgetown. He was firing for Driver Howard Poale, but despite being twice "stuck for steam" going up Balingup bank, he marvelled at the experience of shovelling coal and hearing the rhythmic sound of steel wheel on rail.

"The railways were special — you would come off the Bunbury express passenger and would be told you had to go out to Dardanup to pick up a load of timber. You would arrive out there and haul back 60 in length of sleepers. The railways staff were very easy going then," explained Tom.

"There were a lot of characters amongst railway people. I can remember when Greenbushes Tin had started. I was firing for Jimmy Buck. Jimmy was a driver who liked his beer. The townsite was about a mile from the railway. He decided to walk to town. On his way back Jimmy got lost and a search party was marshalled to find him. The train was delayed a few hours."

To Tom Hastie the railways were different in those days. Railwaymen were mates then. *"It doesn't seem the same today,"* he explained.

Tom Hastie had plenty of mates. They used to call him "Stirrer". In '38' he was appointed driver at Armadale. *"To become a driver in that era you had to wait till somebody retired or died,"* said Tom.

He drove the suburban line with an occasional run to Jandakot on a freight train. *"It was hard work on the 'N' class tank engines. The trains were full; in those times more people travelled by train. I spent three years at Armadale mostly on the 5.55 am morning shift."*

"They called me 'Stirrer' because I used to play a few monkey tricks. I can recall another driver Tom Johnson accusing me of hiding his tucker box. It wasn't me. Anyway one day I tied some wire to his crib box and attached it to a post at the loco shed. Old Tom came to pick up his crib and nearly pulled his arm out of joint. Did he abuse me!"

"While I was at Narrogin Old Bill Clarke the Barracks Caretaker had some kittens hanging around the Barracks and he wanted to get rid of them. One day he put them in a bag and placed them in a wagon of a freight train I was working.

"I saw him do it. When we arrived at Williams I rescued the kittens and handed them over to the crew of the freight train working back to Narrogin. The kittens were returned to the Barracks. For Bill Clarke it was a constant puzzle as to how the kittens walked back from Williams."

Tom Hastie enjoyed his stay on the old steamers. He drove the first 'Australind' passenger train from Perth to Bunbury.

The loco was an old oil burner and the trip took just under three and a half hours.

"You worked hard in those days, shovelling coal, keeping a good level of steam, in all different weather conditions, some days hot and others miserable and cold. Diesel locomotives don't present the same challenge that steam did, one does not have to work as hard today."

Tom Hastie — by Network's artist

Tom was not only a locomotive driver but a keen union man as well. In that era Jim Kennelley was President of the Western Australian Locomotive Engine Drivers, Firemen and Cleaners' Union. Then he went into Parliament. The union was then headed by Bill Rudinger.

"He was a very good man Bill Rudinger. If you were right he would fight for you. If you were wrong he would tell you straight. I wish the same situation existed today. In those days the union was strong — every man was a unionist."

Tom Hastie was on a branch committee of the union and assisted the union in obtaining a reduction of the working week from 48 hours to 44 hours. He also worked hard in ensuring the railway built a rail track around the hazardous Swan View Tunnel. He also appeared at the Arbitration Commission to give evidence on behalf of his railway workmates.

At 64 Tom retired from the footplate. But his railway career was not over. He became Secretary of the Retired Railwaymen's Club, a post he held for 20 years.

Last week Tom stepped down from the chair to enjoy retirement. Well done, Tom Hastie.

Railway Report.

From Australian Timken Proprietary Limited

No. 12 April 1982

Advertisement

Revolutionary new transport system developed in U.S.

A revolutionary new railway transport system has been developed in the United States in an effort to slash fuel costs.

The trailer-carrying 10-Pack "Fuel Foiler" piggyback train has been designed and built by the Atchinson, Topeka and Santa Fe Railway Company in its shop at Topeka, Kansas.

It consists of 10 cars in 10 articulated units, with each car carrying 10 trailers which gives a total train capacity of 100 trailers.

The trailers are equipped with Timken Class E AP bearings, which were developed specifically for use on railway wagon journals and which have made a significant contribution to reducing maintenance costs and extending the life expectation of bearings on both American and Australian railway networks.

The cars, each of which are a little more than a skeleton centre sill with a rigid hitch at one end and a platform at the opposite end to carry the trailer wheels, were built with the basic idea of reducing the gross weight.

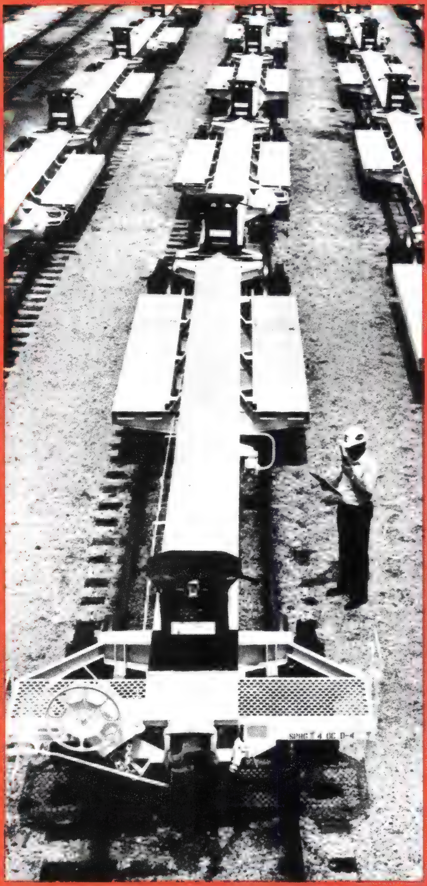
The lightweight construction, coupled with the lower deck height, recently resulted in an annual saving of 5,678,100 L (1,500,000 gallons) of fuel for the five trains Santa Fe now has in service between Chicago and Los Angeles.

Approximately 23,000 L (6,000 gallons) of diesel fuel is saved per round trip between the two locations.

In addition to the weight reduction of over 5.5 t (six tons) per trailer handled, trailers can be unloaded or loaded onto the train in just two minutes through the use of a giant crane stationed at all major Santa Fe piggyback terminals.

Another "Fuel Foiler" has been developed by Santa Fe Railway in order to carry containers. It transported over 140,000 containers during 1980 alone, and they decided a more efficient container car was needed.

Like the original "Fuel Foiler", the new car is constructed also as an articulated car with just an I-beam down the centre and with cross pieces at both ends and the middle to support containers.



The revolutionary 10 pack "Fuel Foiler" has been equipped with Timken tapered roller bearings to reduce maintenance costs.

Its increased efficiency over conventional container-carrying equipment will result from ease of loading, roadability, lighter weight and improved aerodynamics.

Both models operated as experimental cars first and passed operational tests including handling characteristics around curves and over test track of various levels of maintenance plus ease of loading and unloading.

The container cars are now being used in regular service on Santa Fe transcontinental trains to verify their efficient operation under various conditions.

The container model car can carry ten 12m (40 ft) containers or twenty 6m (20 ft) containers, or a combination of the two sizes.

Santa Fe anticipates that this 10-Pack will surpass the 15 percent fuel savings experienced on the trailer models.

Further studies are under way to determine the feasibility of stacking the containers two-high instead of the current single layer to achieve still greater efficiency.

XPT travels on experience

New South Wales commuters will reap the benefits of The Timken Company experience and expertise.

Australian Timken Pty Ltd brought all its world-wide skills to bear during preliminary planning of the revolutionary XPT Inter-City Express recently introduced in New South Wales.

The XPT was built by Commonwealth Engineering (NSW) Ltd for the State Rail Authority of New South Wales under an initial contract calling for 10 power cars and 20 passenger cars.

To ensure the right bearings were fitted to the new train, Commonwealth Engineering consulted Australian Timken Pty Ltd. British Timken had supplied the original bearings for the British Rail High Speed train.

Developed as an immediate response to British Rail's need for shorter journey times and greater passenger comfort, the 200 km/hr high speed trains have covered more than 27 million km on Timken tapered roller bearings.

A total of 288 'SP' bearings were fitted to the main journals of the power cars and 208 single row 'TS' bearings were specified for the power car transmissions.

All have performed admirably to date and helped boost the XPT to a record-breaking 183 km/hr between Albury and Wagga Wagga on September 6 last year.

(continued from page 7)

- Put a moratorium on repayments for their trucks — and don't impose any further jail sentences for non-payment of road maintenance tax.

- Make the principal carriers and consignors pay more for services rendered.

- Introduce increased gross vehicles weights from 36 tonnes to 38 tonnes in line with recommendations made by the National Association of State Road Authorities (NAASRA) to the Australian Transport Advisory Council (ATAC) almost three years before the protest.

State Transport Ministers had for these years managed to defer action on the recommendations and the Eastern States Ministers were quite adamant that their roads and bridges just couldn't stand the added burden.

The atmosphere was explosive and it surely seemed that road transport after all these years was receiving the first nail in its coffin.

However, what road transport did receive and here I take just a little journalistic licence, they received a result commensurate with my third definition of the word revolution for: When the blockades persisted the East Coast states that were so totally opposed to the NAASRA recommendations were the first to concede to militant pressures. Definition: "A radical change in government".

In further considering the subject matter I went back over my own and other people's writings — and I found a commonality between almost all that has been pronounced — and that is that we are all critical of the system — we all solemnly declare our open mindedness to the customer having the right of modal choice yet at the same time only thinly veil our modal bias and/or our dollar motivations, and the fact that we go along with the customers choice as long as it suits us.

est today I fall into the same trap I suggest I look even closer at the words multi-modal and endeavour to define what we really mean by the term.

To my mind multi-modal transport denotes a method of achieving a complete transport task when the transport mode performing the line haul function is incapable of a total door to door service.

And indeed while road transport is a mode which by its versatility and flexibility is more capable of carrying out a total transport task, we find nevertheless that the bulk of Australia's domestic road transport effort measured in tonnes carried or vehicles and drivers employed is largely multi-modal.

There can be no doubt that unless a consignor and consignee are connected by pipeline, rail head to rail head or are both on wharf facilities, then a truck will be used somewhere in the physical handling process.

As we are only too well aware, the impact of this fact was brought home to us recently when the TWU-ARTF log of claims was frustrated by legal but not necessarily practical process and Australia suffered a national truck drivers strike — the result was that all other freight carrying modes were brought to a halt.

So who can deny that at least in a feeder service urban transport sense, Australian transport is predominantly multi-modal.

In the interstate and long distance intrastate arena the battle scarred warriors of transport give ample evidence that the customer still enjoys an acceptable level of modal competition — but at the same time large volumes of cargo are moved by the freight forwarding industry and its highly succesful pattern of road — any mode — road service, and though the freight forwarding industry does come in for a great deal of flack from the various dedicated industry segments I venture to say that within the hire and reward facet they represent the largest fleet owners in our country as well as being very significant partners to the rail and sea modes.

Disregarding the obvious multi-modal requirements for operations such as the trans Bass and trans Tasman road-sea-road trades, what are the motivations for adapting multi-modal systems when one mode could perform the task?

To my mind there's a fairly simple answer, the name of the game is to sell and supply an efficient transport service, to perform a vital part of the overall distribution pattern — the other fact of the same game — is to make a dollar in the process and so the forwarders review their task and as business people seek the best of all worlds.

I should at this point make it abundantly clear that I'm not suggesting that multi-modal transport is the only way to go nor am I suggesting that either rail or road are necessarily the chosen one.

What I am saying is that each of the transport modes possesses distinctive characteristics of cost and convenience, dependant on the type and quantity of carriage needed by the shipper.

The forwarders role (and this doesn't have to mean one of the industry giants) is to arrange the movement of freight by the most suitable transport mode or combination of and not fall for the trap of being a hobbyist with only the one form of transport in mind.

Having grown up with road transport and been responsible at some time or another for trucking operations in every State of Australia and in the highlands of Papua New Guinea, I'm only too aware of the dangers inherent in becoming a transport hobbyist or allowing your management to adopt such a stand.

Peering too deeply into ones own parochial tunnel and ignoring the merits of all others and overlooking the need to earn a dollar, can be fatal.

In my experience, whenever I have let this pattern, creep into an operation I've found that the deeper management's head entered the tunnel the more rapidly the bank account was drained. I hasten to add that whilst I wasn't in rail transport at the time their fortunes changed from profit to loss in the 70s there isn't much doubt that hobbyism at an even more dramatic level than road was partly responsible for their downturn.

I'm delighted to say that most rail systems have now started to reduce their deficits as they cease pursuing volume for volume sake and embrace a very distinct multi-modal road-rail-road association.

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(continued from page 47)

The oil industry is another example of what is to my mind a copybook distribution pattern with the bulk of the task being performed by road transport within the metropolitan areas of our major cities — intrastate activities with long bulk hauls are mainly multi-modal road-rail-road operations and finally to the movement of stock over extremely long distances the oil companies go down to the sea in ships.

From statistics made available by the Bureau of Transport Economics (BTE) it would appear that Australian Transport modes are coming closer to the task of best fit, though there are still many contentious areas.

It seems to me that a great deal of credit for this healthy change is due to a railway colleague of mine who was the first railway man to my knowledge who publicly declared that his system was transporting freight that was unsuitable to his mode.

I refer of course to Alan Reiher the Chairman of the Victorian Government Railways but who was at that time responsible for the New South Wales system.

He made the statement that 3.5 million tonnes of miscellaneous freight handled by his system attracted too high a handling cost and should be transported by road.

The New South Wales inquiry into freight transport headed by Gavan McDonnell confirmed Mr Reiher's statement and added that 10% of the State's rail freight activity generated 100% of its freight loss.

Since that time there has been a gradual move by all systems to quit the freight consolidation business but to offer a line haul multi-modal service in conjunction with private enterprise carriers.

Mr Chairman, may I at this late stage offer my apologies to any of today's participants who were hoping for a technical discourse on this subject — to my mind there aren't any technical secrets, multi-modal transport is just a simple but effective and in many cases quite necessary method of achieving a total transport service.

In the general freight arena my own ilway system — Australian National — markets a multi-modal service with our content being very clearly the line haul segment.

We have become partners to not only the freight forwarding industry but also to the road transport operators who would rather piggy-back their vehicles to Alice Springs or Perth than run them over poor roads or exhaust themselves or their drivers over treacherously long distances.

The transit times we are now achieving between capitals coupled with realistic charges show a financial advantage to the road operators who use our service. To those that don't perhaps I should suggest, with respect of course, that they withdraw their heads from the tunnel.

Mr Chairman, as I am about to sum up and I usually manage to be just a little controversial, may I set the scene by quoting a lady of international fame and renown.

For it was Alice in Wonderland who said; "Everything's got a moral if only you can find it".

So in conclusion, Mr Chairman, ladies and gentlemen, I'm fairly relaxed when I say that as a result of the lessons learnt from the transport highlights that I've enumerated today we now enjoy greater multi-modal understanding and practice.

As a result of this terribly exciting period in transport history that most of us have been privileged to experience, I feel it can be said that Australia does enjoy an efficient, quite flexible transport system.

If I were asked to nominate the highlight which contributed most to this state of affairs it would be the Hughes and Vale case that opened Australia's roads and led to an extended period of intense competition and development.

You will recall that it was soon after that event that we saw the entry into the industry of the owner operator and who could argue that it was his productivity that created the stimulus and indeed the need for all other transport modes to improve and update their services and attitudes in order to survive.

Competition among the modes has been a force for social good, however, we shouldn't allow ourselves to be lulled into a false sense of self-satisfaction when industry leaders tell us, as they do from time to time, that Australia enjoys the most attractive surface freight rates.

The statement, while possibly quite correct, has its basis not only in the overall efficiency of the industry but is also due to the level at which line haul services can still be procured.

I understand that the TWU-ARTF agreement for owner driver reward has brought for some a more equitable distribution of the financial cake.

However, I'm also told that the published schedule of subcontractor rates are still in most cases the best rates they don't enjoy.

This can only be due to one of three reasons:

- Either the operators are now asking too much for their services, or:
- They are still being exploited by the less desirable elements of our industry, or:
- They still have no basic economic understanding and so are still prepared to carry for rates lower than the standard others are endeavouring to win for them.

I have been under the impression that the subby problems were over but it was only a day or so ago that I read a heading in the 'Australian' which gave me cause for concern, it read:

> "Economic pressure causing accidents".

The article went on to say that the Long Distance Road Transport Association of Australia is concerned that economic pressure on drivers is contributing to the road toll.

The secretary of the particular branch said:

> "They (the operators) are forced to drive at high speeds because of the economics of the industry".

It does of course indicate, Mr Chairman, the cheapest is not always the most desirable.

NOISE!

Quiet words of advice in the use and selection of Nylex Noise Control Materials.

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Damping thick metal plates	subway wheels; transformers; bridges; gears; ship bulkheads and decks; machine tools	DYAD	108
Damping and Absorption	machinery housings; in-plant enclosures	Foam Damping Sheet	109
Absorption	business machines; enclosures; pipe wrapping; lining sound trapping labyrinths; anechoic chambers	Soundfoam/Embossed Soundfoam	102 101
Absorption and Barriers	machinery enclosures; business machines; yacht and recreational vehicle generators; appliances	Soundmat LF/Embossed Soundmat LF/Film Facings	110 103/110
Absorption with special surface treatments	near liquid spray equipment; cleanable surface applications; marine applications	Soundfoam/matte film finish Soundfoam/fabric facing Soundfoam/Tedlar® Soundfoam/metalized Mylar® Soundfoam/tufted fibre	103 116 103 103 116
Absorption for vehicle cabs	headliners and side panels for cabs for off-highway vehicles and similar applications	Cabfoam Soundfoam/perforated vinyl	104 103
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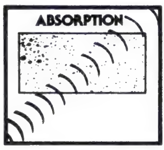

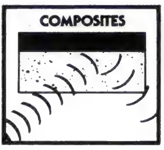

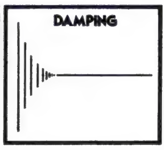

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Development of bogies for XPT

The design of power and trailer bogies for the State Rail Authority's ultra modern XPT passenger trains presented COMENG with substantial engineering problems in meeting operating parameters of the new high speed vehicles on Australian track which was not specifically constructed for this purpose.

In this first of a series of articles in Network on the subject, COMENG Assistant Engineering Manager (NSW) and Member of the Institution of Engineers of Australia, Colin F. G. Butcher examines some of the theoretical studies undertaken to reach these parameters and achieve the basic objective. The articles are based on a comprehensive paper which Colin presented to the Institution of Engineers at the first Railway Engineering conference held in Sydney.

Introduction. The Australian non-metropolitan railway systems are predominantly freight carriers and the infrequent passenger services are generally operated as a public transport service at considerable loss.

The community subsidy per passenger journey in 1977 in New South Wales averaged $22, or about 73% of the total operating cost (Reiher). The low fares compared with other transport modes failed to overcome passenger resistance to long journey times and poor riding vehicles. Increasing fares without a substantial improvement in the service offered was likely to further reduce traffic and increase the loss on these services.

The introduction of modern high performance rolling stock was seen to have the potential to attract more passengers and increase productivity.

This formula had proved to be successful overseas and in Australia, was exemplified by the Perth-Kalgoorlie 'Prospector' services operated with diesel railcars.

The State Rail Authority expressed considerable interest in purchasing similar cars but reduced in overall size to suit New South Wales clearance limits. The designers of these cars could envisage some serious practical problems in reproducing the original performance and excellent maintenance access within this smaller space envelope and concluded that a diesel railcar concept did not appear to be a viable option for New South Wales if high speed was essential.

The alternative to the underfloor-engined diesel railcar is a high speed locomotive hauling a set of passenger cars. The traction equipment must be light and the drive system must have a low unsprung mass in order to minimise dynamic wheel to rail forces at high speed. Traction equipment of this type is manufactured by BRUSH for the highly successful British Rail HST, consequently, BRUSH were asked by COMENG to investigate the suitability of this proven equipment for service in New South Wales.

This early feasibility study in October, 1977 may be regarded as the start of the XPT project.

The State Rail Authority specification issued in January, 1978 called for diesel railcars but included the option of head-end power for higher performance. Detailed investigations indicated that the basic HST equipment could provide the performance necessary to climb the long steep gradients found on most New South Wales routes and still achieve the specified top speed of 160 km/hr where track conditions allowed. The most severe requirement of starting four passenger cars on a one-in-thirty gradient, with a single power car, could be achieved without difficulty.

High speed trains are normally associated with high costs that can be justified on high density inter-city services, but the XPT concept proved to be an economic solution. The capital cost per passenger seat was 12% less than the lower performance diesel railcar alternative, and the single 12 cylinder engine should be substantially cheaper to maintain than the seven engines required for the equivalent five railcar set.

Measurements made by British Rail indicate that the fuel efficiency should also be superior to conventional traction equipment (Stokes).

The high power to mass ratio of the XPT concept not only provides the potential for high speed but enables it to climb gradients rapidly and to quickly regain speed after slowing for curves.

This was clearly demonstrated by the initial State Rail Authority investigations into the XPT performance using their M-TRAIN programme. These showed that a 10% increase in speed would substantially reduce journey time on all main routes using XPT.

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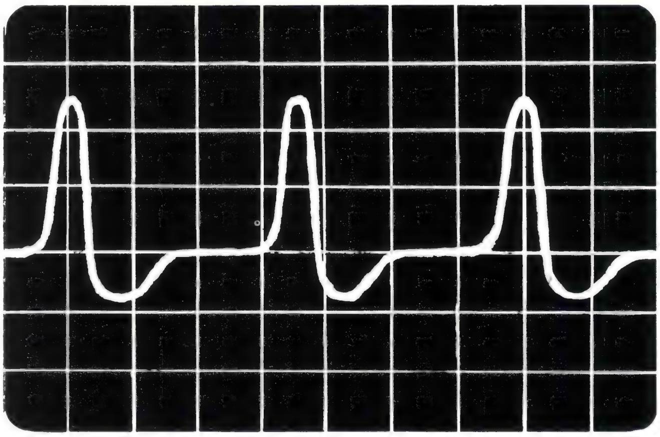

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(continued from page 12)

operated at rates of up to 24 trains per track per hour with eight-car Harris and six-car Silver and Orange trains.

This one-deck stock has fewer seats and more standee space, and loads up to 1 100 per train in the busiest part of the peak. Fortunately the practical maximum rate of 26 400 people per hour is rarely sustained for long, as very crowded travelling conditions are involved at this density. The Frankston/Dandenong fast tracks sometimes attain similar loadings and it will be interesting to see the long-term impact of the Melbourne Loop; it could well eclipse Wynyard (High Level) if patronage trends change, and traffic patterns alter to satisfy external demands.

The busiest line in Queensland is the city tunnel section from Bowen Hills and Brunswick Street through to Central and Roma Street. This is the key two-track trunk link in the whole Brisbane suburban system and, despite construction of the Merivale Bridge, loadings are still higher on the sections from the north into Central than they are from the west and south via Roma Street. Berthing tracks now exist at all three key city stations in Brisbane, and the line is signalled for nominal 120 sec headways. Even in diesel days, Network counted four trains being despatched from Central in eight minutes of a slightly dislocated peak. The normal maximum headway operated is, however, 24 trains/h with a nominal 1 000 people per six-car electric or seven-car diesel-drawn train (24 000/h). A more comfortable planning maximum is around 800-850 per train, or around 20 000/h.

On virtually all other Australian suburban lines both train frequencies and loads per train are usually way, way below the levels of these 'big four' busy tracks. Even on Sydney's Eastern Suburbs Line, for example, short six-car two-deck trains suffice in the peak with only a moderate degree of crowding between two city stations, Martin Place and King's Cross. The 15 trains/h service equates to under 12 000 people per hour — around half of the busiest Sydney line, upstairs at Town Hall. While many commuters would dispute the fact, very few full-length peak-period trains in either Sydney or Melbourne load over 900 people, and most carry only 600 or so. Our peak hour travelling conditions are generally far more civilised than in the great cities of Europe and the Americas, and indeed, generally, much more civilised than they were out here thirty years ago; **(to be continued).**

The question of passenger comfort remained the one criteria to be satisfied if passengers are to be attracted back to rail for non-metropolitan journeys.

This aspect of the XPT project is covered by the main body of this paper, which gives details of the development of the bogies for the XPT power and trailer cars. The development programme probably gathered more track data of use to bogie designers than any previous rail vehicle project in Australia.

Preliminary studies.

Phase One. In most countries, high speed passenger trains are only operated where traffic justifies an intensive inter-city service that can bear the cost of maintaining the track to high standards. In Australia, the non-metropolitan rail tracks are used predominantly by slow freight trains and special track standards for the infrequent passenger trains cannot be justified. Past experience with overseas passenger bogie designs, that have an excellent reputation for smooth riding on their home tracks has clearly demonstrated the need for care in selecting designs that are suitable for use in Australia. The two basic requirements are soft suspension systems and generous working clearances.

The British Rail HST power car bogie is of the modern bolsterless type and uses coil spring primary and secondary suspension (Stainier). This arrangement is adaptable as clearances and spring rates may be changed where necessary. At the outset this bogie design was recognised as being a suitable basis for the XPT power car bogie, especially as the same basic traction and braking equipment was to be used. Consequently, BRUSH approached British Rail at the earliest feasibility stage to ensure that the design would be made available for production in Australia.

High speed operations can be damaging to the track if the dynamic wheel to rail forces become excessive.

Investigations at the time indicated that the HST frame mounted traction motor arrangement imposes less dynamic force on the track at 160 km/hr than conventional diesel electric locomotives operating at the existing limit of 115 km/hr (Butcher & Horn).

The HST trailer car bogie is more conventional in concept and uses a fairly stiff air spring and swing links for the secondary suspension. The ride on British Rail high speed tracks is excellent but the air springs do not provide good attentuation of inputs from slightly dipped insulated joints and British Rail maintenance procedures were tightened to ensure that these surface blemishes are quickly removed (Collins, et al). This design also had the lateral clearances increased and the damper settings optimised, leaving little room for further improvement to suit rougher track (Burdon). The HST also operates over essentially straight track, where the long sweeping curves allow the full 200 km/hr maximum speed to be sustained for much of the journey, a very different set of conditions to XPT circumstances.

These general considerations made it appear inevitable that the HST trailer car bogie would need to be substantially redesigned for XPT service. The extent of the changes required could not be defined at this early feasibility stage due to lack of adequate track data, but it was clear that the ride quality specified could not be achieved by making some simple adjustments.

Experience with prototype air sprung bolsterless bogies fitted to a double-deck suburban car indicated that this basic design had the potential to provide the required performance on State Rail Authority tracks. This light and simple design is similar to British Rail suburban car bogies, (Ball), but has coil spring primary suspension. The wheelsets are located by trailing arms, similar to the arrangement used on the European standard passenger car bogies derived from the SNCF Y32 design. In common with the HST and many other modern designs, this COMENG design has rubber at all interfaces to give proper control of movements and good noise isolation.

The low mass aids dynamic performance, particularly stability against hunting and the low polar moment of inertia allows quick response to changes of direction whilst keeping lateral dynamic forces applied to the track at low levels.

At this stage of the investigations it was clear that the HST power car bogie, adapted to obtain the optimum suspension performance, would provide a good ride for the crew and that the passenger car bogie would need to be specifically designed to suit New South Wales track conditions, and would need to have similar suspension parameters to the prototype suburban car bogies.

Phase Two. Following general acceptance of the XPT concept in place of diesel railcars, the State Rail Authority requested specific details of the HST trailer car bogie performance on New South Wales track. The lack of adequate track data prevented the use of computer modelling techniques, but an alternative approach was suggested in which the performance was compared with a known base case. The HST trailer car BT10 bogie was compared with the prototype CT22 design by calculating their response to various input wavelengths. This was further refined by setting a ride quality standard and calculating the acceptable track roughness across the frequency spectrum. This approach showed that the XPT car length and bogie centres tended to isolate the vehicle from pitch motion inputs making the bounce mode critical in the vertical plane. The softer secondary suspension option was shown to have about double the track roughness tolerance of the BT10 bogie over the most critical frequency range of 5 to 10Hz. At higher and lower frequencies the tolerance curves diverged, indicating greater relative advantage to the CT22 design. As rail lengths used in New South Wales are less than 14m, the dominant input frequency should not exceed 3Hz. In other words at the lower speeds more appropriate to New South Wales conditions, the softer vertical suspension has a major advantage.

In parallel with the above investigation, a simple lumped mass computer model was used to make a similar performance comparison. This was tested against the known performance of the BT10 bogie design on British Rail track and also was found to agree with the general conclusions outlined above.

Using the track vertical wavelength quoted by the State Rail Authority, and an amplitude of 5mm to represent mainline track, this numerical integration programme produced to the following ride index predictions:

Speed (km/hr)	BT10	CT22
115	3.0	2.2
160	3.4	2.4

This same modelling technique was used to assess the lateral ride. The results were very similar for both bogie types with a ride index of 2.5 at 115 km/hr and 2.8 at 160 km/hr.

These theoretical studies relied on fairly simplistic representation of both vehicles and track geometry, consequently, the results only provide a coarse comparison for initial assessment purposes.

Not all British Rail track is maintained to the standards required for high speed passenger trains and so British Rail engineers suggested testing the BT10 bogie on track that represented New South Wales conditions. The State Rail Authority supplied copies of sections of track recording charts so that these could be compared with similar charts for British Rail track to identify suitable test sites. The chart for the better quality New South Wales track was found to be very similar to sections of the British Rail West Coast Main Line, over which BT10 bogies regularly operate at 160 km/hr. The ride over these sections is particularly poor and from test records on file, British Rail predicted a ride index of 3.0 for the standard BT10 at 115 km/hr over track of this quality. The chart section for average New South Wales track was taken from the Main North Line at a point where speed is limited by tight curves to 60 km/hr. Similar track on the British Rail system is found on lines used only for freight trains, where high speed trials are not possible.

These further initial investigations supported the view that the BT10 bogie is not suitable for New South Wales track conditions, but they also helped to dispel doubts that suitable suspension systems could be developed. The ride performance specification was revised to provide a much clearer definition of what was required, with every expectation that the criteria would be met. This specification limited the acceptable vertical and lateral ride index to 2.8 at 160 km/hr on straight track and at the existing speed limits on curved track, over any 10 second period.

Phase Three. The vibration environment or ride quality experienced by vehicle passengers may be predicted with reasonable accuracy if the suspension parameters are known and the track is fully described mathematically. The most complete track roughness description is the power spectral density (Corbin). Track roughness data was not originally available in this form, however, all track data gathered by the State Rail Authority EM80 track recording car is stored on digital tape and copies of some records were made available for processing. This revealed a distinct difference between most New South Wales track and the 260 km section of the Main South Line between Harden and Albury, with the latter being significantly smoother in both the lateral and vertical directions.

The high power to mass ratio of the XPT couples high speed with the ability to climb gradients rapidly and to quickly regain speed after slowing for curves.

The ride predictions obtained using this more comprehensive track data gave a more encouraging result, but still showed that the standard BT10 would not meet the revised criteria in the vertical direction. The lateral ride performance was shown to be very sensitive to the effective wheel to rail conicity. With a moderate conicity, the predicted performance was good, but at higher conicities the ride deteriorated as follows:

Speed (km/hr)	110	130	145	160
Vertical Ride	2.5	2.7	2.8	2.9
Lateral Ride (0.1 conicity)	2.2	2.3	2.4	2.6
Lateral Ride (0.3 conicity)	2.6	2.9	3.1	3.4

These predictions are for 90% of the Main South Line and were obtained using a ten degree of freedom vertical model and a seventeen degree of freedom lateral model. The inputs in each case assumed both rails have the same profile, in other words, the roll inputs due to dips in one rail were not included.

At this stage British Rail engineers suggested design modifications that would improve the BT10 performance with the intention of matching the revised specification. The main changes proposed were to reduce the secondary suspension vertical and lateral spring rates by using larger air springs of the type fitted to suburban car bogies and increasing the length of the swing links. The ride predictions for this modified design shows a significant improvement in the vertical ride quality, but no change in the lateral suspension performance.

The modified BT10 suspension rates closely matched those of the air spring, bolsterless bogie that was included in the original XPT concept, and that formed the basis of the contract at the time, however, the State Rail Authority expressed renewed interest in the BT10 design, in modified form, as it embodied considerable operating experience, albeit in a totally different environment.

(to be continued)

Pilbara sleeper study

Early one morning in November 1981, a team of specialists assembled at the Cape Lambert end of the Cliffs Robe River Iron Associates Pilbara iron ore railway line. They were engaged in making final arrangements for the field phase of a survey designed to obtain a representative overall impression and some detailed information on particular aspects of sleeper performance.

The team was comprised of John Barnacle, a CSIRO timber scientist; Geoff Main, CRRIA Railroad Engineer; Bill Minchin and Dan Price, marketing and technical representatives respectively from the Timber Preservation Division of Koppers Australia Pty. Ltd.

For the visitors in particular, the ensuing period was to prove full of interest, as might be expected, given the opportunity to see some aspects of the operation of a great railway at such close quarters. Also, in spite of the tight schedule and searing heat, it was still possible to appreciate the strange land and desert colours of the unique landscape, looking its best after the recent wet season.

In a way the survey had its genesis almost a decade earlier when it was decided to use preservative treated karri sleepers in the construction of the Cliffs Robe River Iron Associates iron ore railway line in the Pilbara.

The decision was made because it was not possible, in the time available, to supply the total number of sleepers required in untreated jarrah, the form then preferred.

There were two reasons for the concern felt. One was that karri had seldom been used as a sleeper and never in a climate such as that found in the Pilbara. The other was the standard of treatment employed. The latter, mainly for reasons of cost and the urgent delivery required, was significantly lower than then indicated as appropriate by CSIRO track exposure tests and now generally considered desirable.

By the time the line started operating in August 1972, a total of 360,000 225 x 150mm x 2.7m wooden sleepers had been used. Half of these were supplied in untreated jarrah and the remainder in treated karri.

The region through which the railway runs for 130 km, approximately south west from the coast near Dampier, is generally undulating and interspersed with low but rugged ranges and deep gullies. The track does not run straight and level for much of the distance on account of the 'broken' nature of the terrain.

The annual rainfall of 25-33 cm occurs mostly in summer and may be concentrated in a few brief periods.

The temperatures are fairly high throughout the year frequently exceeding 40°C.

Since starting operation, the line has carried an estimated 180 million gross tonnes rising from $3^1/_2$ mgt in the first half year to a projected 24 mgt for the current year.

In mid 1981, after nine years operations, a check on maintenance records and an examination of sections of the track indicated the karri sleepers were performing so well that an average service life in excess of 35 years was a possibility. The Fourth Rail Track and Sleeper Conference held in September of that year in Adelaide provided the occasion to convey this salutary discovery to the railway industry at large. This was delivered in a paper contributed by representatives of the Timber Preservation Division of Koppers Australia Pty Ltd, owner of the company which carried out the actual treatment in 1971-72.

Reactions to the good news ranged from outright scepticism through relief to genuine enthusiasm. The consensus of opinion though was that it deserved serious attention and careful examination of its implications.

Recognising the value of such an exercise, the Division of Chemical Technology of the CSIRO accepted an invitation to provide expert guidance for a more detailed assessment of the performance of the wooden sleepers in the CRRIA line.

Whilst verifying the findings of the earlier investigation was important, the principle objective was evaluating the track's potential for studying the long term service performance of commercially supplied treated sleepers of this type. In theory it appeared particularly suitable for the purpose, the sleepers being of uniform known type and age and the mechanical and biological stresses also being reasonably uniform and known. John Barnacle, the scientific officer assigned to the job by the CSIRO ruled however that the final judgement on the point should be made by statisticians of his organisation on the basis of data collected on the track to their directions.

As the group planned its programme in the air-conditioned cool of an office, the temperature outside was already soaring toward the mid forties level reached on the coast on each of the three successive days of the survey.

Inland on the job, it became even warmer but most of the party tried not to believe it, especially those accustomed to the 'cool' of the east and south.

The simple system the CSIRO proposed to be employed on this occasion had the limited objectives defined above firmly in mind. If the information gathered confirmed the line to be suitable for service record purposes, a more detailed scheme accounting for many of the variations in track construction and geometry, terrain and wood degrade hazard could be prepared by John and his CSIRO colleagues.

At each of a dozen and a half locations, some selected at random but most for a particular reason, the condition of 50 successive sleepers was ascertained in fair detail. Apart from the species, the record made included reference to general appearance; location and extent of significant splits; magnitude of top surface 'brooming' where present; and the number, position and tightness of fastenings at each rail seat.

All locations were situated on tangent track. Plates and two square gauge dog spikes were used in all cases. At three of these locations, the sleepers were untreated jarrah, included for interest and comparative purposes. All the rest were treated karri. Time limitations precluded the optimum procedure of determining all sample locations randomly. Most were selected for a specific reason. Included amongst these were factors such as reported loss of line and level; termite attack or presence; exceptional superficial wood deterioration; or a feature of the track on terrain of possible relevance such as a steep grade or a creek crossing. The method to be used was quite simply to get out on the track and take a good hard look at as many sleepers as possible.

Over the period of the assignment, the mercifully air-conditioned CRRIA Toyota Hi-rail which provided both transport and refuge travelled 700 kilometres on rail and service road in pursuit of this end. At each sample location, the battle with the ballast covering the sleepers, the heat reflected and radiated from the track and the sweat and the flies was followed by the reward of copious drafts of ice cold water and the comparative chill of the Hi-rail cab on, the way to the next one.

Each evening as the sun made a welcome departure, and the ubiquitous Hi-rail rolled down the rails towards Wickham and the comforts of civilisation, the voice of Elizabeth Langdon, the evening shift lady traffic controller was a pleasant surprise. Her homely tones seemed to complement the mellow sunset hues the way the laconic style of her male counterparts did the dayshift bustle and glare.

Aided by the quiet efficiency and stoic charm of Geoff Main; Pat Levi who piloted the Hi-rail; and John Barnacle's insistence on a daylight to dark working day and the meal-less lunch, the team managed to get the numbers needed.

At the end of three days, it was possible to draw some facts and conclusions from a preliminary examination of the data collected. For example, 97% of the 750 treated karri sleepers inspected were rated as having a 'good' general appearance.

The region is undulating, interspersed with rugged ranges and deep gullies.

Only two sleepers out of this number (0.25%) were considered to be rejectable. All sleepers inspected had only the original two spikes in place. In the treated karri, 93.5% were classified as tight.

The rating 'good' was assigned only to sleepers the condition of which was such that they could be expected to be still in A1 condition at the next inspection, assumed to be five years hence.

On his return to Melbourne, John Barnacle turned over the record of the team's observations to the waiting statisticians who will evaluate them in detail. They will have two main objectives. First to check and elaborate on the major conclusions including those referred to above. Second, to decide on the suitability of the CRRIA track and its treated karri sleeper as a place to study the longterm service performance of the latter.

If the decision is affirmative, they will then assist in the design of a sound and comprehensive inspection scheme for this purpose. Then with the plan completed, it will only remain to organise the resources required and get on with the job.

Koppers Timber Preservation Division have undertaken to act as co-ordinators for this purpose. Interest in the performance of treated wood track timbers, particularly in heavy haul lines is growing rapidly. It is expected that the exercise will attract the support and co-operation of other organisations besides CRRIA and CSIRO and that the information gathered will be of considerable benefit to railways throughout Australia.

In conclusion then, the excellent performance of the CRRIA karri again demonstrates that with the aid of preservative treatment sleepers capable of a superior technical and economic performance can be produced from most, if not all, of Australia's commercial hardwood species.

Evidence from other sources has also shown that the average service life of even the reputedly 'durable' species will be approximately doubled by this means. This fact reveals the easy option, virtually unique to Australia, of using certain sleeper species in the untreated form as a short term, outdated, uneconomic practice. It is in fact very difficult to understand how using rail track timbers in the untreated form can ever be justified.

The implications here for the nationally vital objective of forest conservation are clear. Wood preservation by extending service life makes an indispensible contribution to maintaining the forests for the use and enjoyment of the community in perpetuity. It follows that all wood users but especially those like railway operators using this vital resource in huge quantities have a responsibility to ensure that the benefits of wood treatment are fully considered when specifying their needs.

The time when depletion of the timber resource forces up the prices and makes it necessary to resort to costly substitutes may not be far away unless the lesson of the superior performance of Pilbara karri and other treated track timbers is learned and applied.

The clip

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Swedish King tours METROL

VicRail's METROL control centre received an honoured guest recently when the King of Sweden, Carl XVI Gustaf, visited the complex as part of his State visit to Victoria in April.

Of special interest was the train describer system supplied by the Swedish company, L. M. Ericsson, to monitor and control train movements within Melbourne's suburban network.

This computerised train describer and remote control signalling system, due to come into service later this year, will initially come into operation in the inner suburban areas.

The system will control the movement of all trains in this defined area, giving the precise location of each train.

When a train description has been entered into the system it will appear on the colour video screens in front of the area controllers at METROL.

METROL, a joint venture of VicRail and the Melbourne Underground Rail Loop Authority, was brought into being in January last year to provide the necessary sophisticated signalling and communications equipment needed to operate both the City Loop and the suburban service in general.

On hand to greet King Carl XVI Gustaf when he visited the Batman Avenue building were the Chairman of MURLA, Mr Ian Beaurepaire, and VicRail Chairman, Mr Reiher, together with representatives from both authorities.

Locos handed over

The first of thirteen new locomotives were formally handed over to Westrail at Midland Passenger Terminal recently.

The new DB class locomotives will be phased in to replace the X class units, which have now reached the end of their service life. The X class units were the first series of diesel locomotives to be introduced by Westrail in 1954.

Complete with air-conditioned cabs, a first for the Westrail locomotive fleet, the DB series are 16 cylinder diesel electric units with a gross power output at 1660 kw.

The locomotives were constructed by Clyde Engineering Ltd. at Rosewater in South Australia and will be used by Westrail to operate bulk haul trains on Westrail's narrow gauge network in the South West of the State.

First formal meeting for Board

It was straight down to work when the directors of the new New Zealand Railways Corporation met for their first formal meeting in Wellington on April 15. Railways Minister George Gair was there at the beginning of the meeting to welcome the Directors on behalf of the Government.

Following the formalities the Directors and Railways management then quickly turned their attention to the running of New Zealand's largest transport organisation.

The picture above shows, from left: Murray Hercus (Director); Sir Allan Wright (Director); Malcolm McConnell (Director); Bob Lorimer (Director); Joe Auton (Director); Kevin Hyde (Secretary); Minister of Railways, George Gair; Lyndsay Papps (Chairman); General Manager, Trevor Hayward; Deputy General Manager, Gordon Purdy; Asst. General Manager, Euan McQueen; Asst. General Manager, Bob Henare; Peter Egan (Director).

* * *

Bathurst w'shops opened

The Minister for Transport, Mr Peter Cox, recently opened the $9.3 million Bathurst Railway Workshops.

Mr Cox said that this project was one of many undertaken by the NSW Government to honour its 1976 promise to rehabilitate the State's Railways.

"Since 1976 the Wran Government has spent $1 billion on the State's transport services", Mr Cox said, "and a further $1.4 billion will be spent in the next five years".

"I am confident that when Stage 2 of this massive project is completed NSW will have a modern railway system equal to any in the world", Mr Cox said.

Bathurst is one of the great NSW railway centres, which has been immortalised by a great Labor Prime Minister, Ben Chifley himself a locomotive driver.

Railways have been part and parcel of Bathurst since April 4, 1876 and have played a very important role in the town's economy ever since.

At present there are 529 SRA staff based on Bathurst. This means an annual payroll of $9.5 million. The decision to build the Bathurst Workshops was made at a Cabinet meeting held in Bathurst on February 8, 1977.

As well as attending to programmed and unscheduled locomotive overhauls this workshop will also overhaul open type freight wagons. Ten wagons and up to three locomotives can be attended to simultaneously.

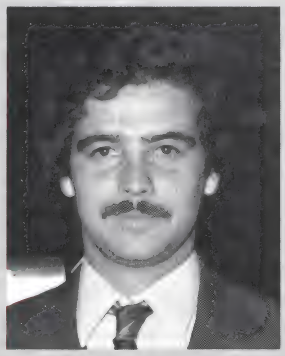
One hundred and sixty four staff are employed.

Damian judged outstanding

Each year, Westrail holds an Apprentice Award Evening. Those apprentices with the best results in both practical and theoretical studies receive awards for their efforts.

The most outstanding student of 1982 is Damian Crompton. Damian is a twenty-one year old electrical fitting apprentice in his final year. His prize is an all expenses paid trip to the eastern states to inspect railway workshops in Melbourne and Sydney.

In his speech of thanks, Damian paid tribute not only to the sponsors who made the annual awards possible but also to those members of the staff at the Midland Workshops who conducted the apprenticeship scheme. Network wishes Damian well, both on his forthcoming trip and in his future career. Those who have met him will know he is an outstanding representative for both Westrail and his fellow apprentices.



Damian Crompton

Station gardens flourish

The traditional gardening competition for railway stations in New South Wales has been reintroduced by the State Rail Authority as part of its ongoing programme of making stations more attractive.

The colourful backdrop of gardens will supplement the station upgrading programme in which 160 stations have been repainted in the last 18 months, with a targetted 100 a year in the future.

For many years the garden competition was conducted in the various sections of the railway service and attracted great interest. Many members of the staff, working on a voluntary basis, took considerable pride in enhancing the presentation of their stations or other work places. In some cases a very high standard was achieved and attracted favourable comment from the travelling public.

Reintroduction of the gardening competition, after a lapse since 1974, has been prompted by station staff, many of whom had continued their interest in station gardens. Under the revamped scheme, certificates will be awarded for various sections as was done in the past. However, as there is no longer a departmental nursery, or gardening staff, it will be necessary for Station Masters to purchase locally any plants and equipment for stations where staff have a special interest in maintaining a garden.

Traffic Inspectors for the section will exercise control over spending to ensure the best use is made of available funds.

It is intended that certificate awards be made in each district following inspections of competition gardens as follows: 1st, 2nd, 3rd and Special Commendation. Judging will be carried out next Spring.

Institute chooses 'STORE 82' co-ordinators

In the December 1981 issue of ROA Network the Institution of Engineers, Australia's National Committee on Railway Engineering called applications for two Volunteer Administrative Assistants (VAAs) to travel to Europe on the 1982 Study Tour on Railway Engineering (STORE — 1982). The basis of supporting the VAAs is the equivalent of granting a travel scholarship exceeding $2,000 in value, in return for part-time assistance in the field administration of the tour.

Fourteen applications were received from people on Government and private railways, in industry and elsewhere in the transport and engineering sector. After a series of regional interviews conducted by members of the National Committee, in which several prominent engineers and other members of the wider Australian railway community assisted, the full National Committee made its final selection at its April 14 1982 meeting.

The National Committee was unanimous in its final selection and the Chairman, Peter Booth, has announced that the two people selected as volunteer administrative assistants are Mr A. R. Carlton and Mr G. W. Wontner.

Ross Carlton is an engineer in the Major Projects Division of the Department of Transport, Canberra. He was previously with the SRA in Sydney in various appointments related to the operations, running and maintenance of suburban and interurban electrics.

Graham Wontner is the Assistant District Engineer for Westrail in Northam, Western Australia, and as such is responsible for aspects relating to the smooth running and efficient management of the District. He was previously with the Southern Region of British Rail.

Culcairn calling

Mrs L. D. Davis,
33 Kirndeen Street,
Culcairn 2660.

25th February, 1982.

Dear Sir,

I am writing to you with the hope that you may be able to help me. The town of Culcairn is celebrating their Centenary, the coming of the railways, and the erection of the first school, at Easter, Saturday 2nd, Sunday 3rd, and Monday 4th April 1983. We were wondering if it is at all possible to place a notice in your paper "Network", as we are finding it very difficult to trace many ex-residents, and as Culcairn is mainly a railway town, your journal would inform many railway employees who have left the town.

Thanking You,
Yours Sincerely,
Mrs L. D. Davis, Hon. Sec.,
Culcairn Centenary Committee.

Papers invited

The 8th Australian Transport Research Forum is to be held in Canberra during May 1983, and will be hosted by the Bureau of Transport Economics. The theme is: 'Transport Problems! What Problems?'

It is expected that the dates for the 8th Forum will be Wednesday 18 to Friday 20 May 1983. The venue is not yet settled.

With only twelve months to prepare the conference it is necessary to take action now. Accordingly BTE is asking for expressions of interest in writing papers for the Forum. All that is required at this stage is an indication of intention and a very broad indication of subject. Guidelines for authors will be dispatched as soon as expressions of interest are received.

BTE will be asking for draft abstracts of papers to be submitted by August 1, 1982. At that stage the final abstract is not required, but it is hoped that thinking about papers will be sufficiently advanced so that a good indication of the line of argument in each paper can be given. This is required so that the planning of discussion sessions at the Forum can proceed.

Draft papers should be submitted to the ATRF Secretariat by November 1, 1982. The Secretariat will then distribute copies of papers to referees for comments. It is important that papers are received on time so that authors can undertake any revision that may be required in the light of referee comments and have final papers and abstracts back with the Secretariat by February 1, 1983. It is firmly emphasised that refereeing is directed towards ensuring the highest possible professional quality of papers presented at the Forum, and not towards selection of subject matter.

Rocket lands in Victoria

Let it not be said that the people of Victoria missed out on seeing the working replica of George Stephenson's Rocket when it was brought out to Sydney recently.

Thanks to VicRail, the Thomas National Transport group and the Australian Railways Historical Society railway enthusiasts were able to see this superb little loco on display at Melbourne's City Square and at Flinders Park just after Easter.

The Rocket hauled a replica of the carriage, Traveller, which also ran in the 1830s on the Liverpool to Manchester run.

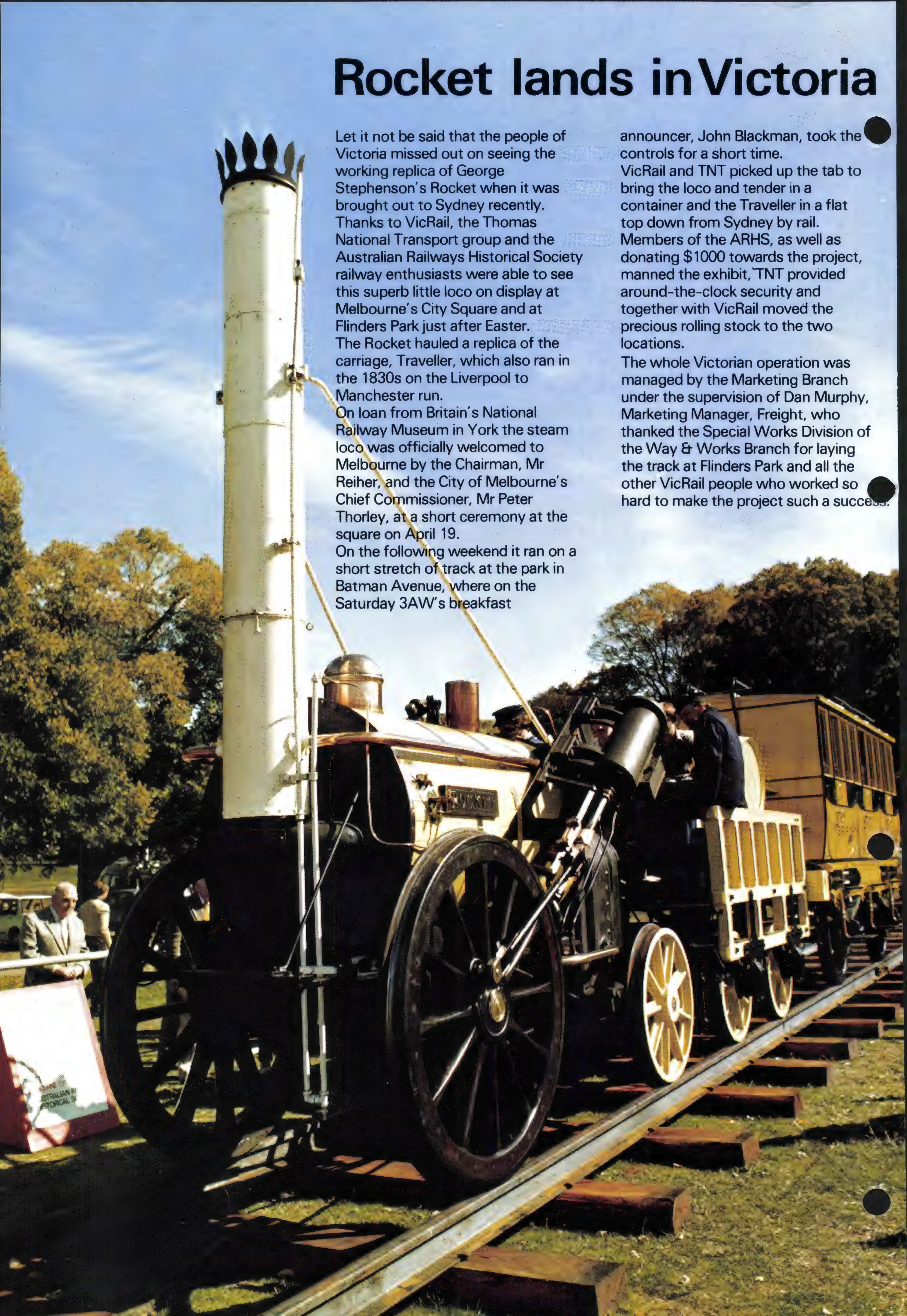
On loan from Britain's National Railway Museum in York the steam loco was officially welcomed to Melbourne by the Chairman, Mr Reiher, and the City of Melbourne's Chief Commissioner, Mr Peter Thorley, at a short ceremony at the square on April 19.

On the following weekend it ran on a short stretch of track at the park in Batman Avenue, where on the Saturday 3AW's breakfast announcer, John Blackman, took the controls for a short time.

VicRail and TNT picked up the tab to bring the loco and tender in a container and the Traveller in a flat top down from Sydney by rail.

Members of the ARHS, as well as donating $1000 towards the project, manned the exhibit, TNT provided around-the-clock security and together with VicRail moved the precious rolling stock to the two locations.

The whole Victorian operation was managed by the Marketing Branch under the supervision of Dan Murphy, Marketing Manager, Freight, who thanked the Special Works Division of the Way & Works Branch for laying the track at Flinders Park and all the other VicRail people who worked so hard to make the project such a success.



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letters

De Meern, Feb. 3, 1982

Sir,

I have read the prospect 'Technology and Australian Railways in AD 2000', published in 'Network', with particular interest. May I be permitted to make some observations on it?

The development of railways in Australia, from the beginning up to the present day, has been marked by inconsistencies in matters of choice of gauge. Although the immense handicap of break-of-gauge is now realised to the full, it is still doubtful whether there is real consciousness of its deeper origins. The political history of the multiple break-of-gauge in Australia may be known in detail, the erroneous ideas that decided men to prefer one gauge to another seem to have remained unaffected by time or reason.

Worse, it must be feared that the same misconceptions that ushered in the intial break-of-gauge between New South Wales and Victoria in the 1850s are now creeping straight into today's prospects of Tomorrow.

What is the essence of gauge? What is the value of mere width-of-gauge? What significance must be attributed to a difference in gauge between railways, other than it precludes through-running?

Let us have an objective look at Table 1 on page 21 of the August issue of 'Network'.

Both for 1 435 mm and 1 600 mm gauge, mixed-function railways an axle-load of 25 tonnes and a speed of 160 km/h are given as typical maximum values to be expected in a more or less distant future; for 1 067 mm gauge systems, however, these figures are considerably lower at 18 tonnes for axle-load and 105 km/h for speed.

Manifestly the originators of the evaluation feel that 1 067 mm gauge, as compared to the broader gauges, implies intrinsically lighter equipment of less capacity and limited overall possibilities.

However, a critical analysis of practices outside Australia demonstrates that there are no significant economic and/or technical grounds supporting such differentiations on the basis of gauge.

Within very wide limits the gauge of railway track seems to have liitle influence on its suspension capacity. This is readily understandable as the middle parts of sleepers and the ballast down the centre-line of the track structure have no bearing function; indeed, the broader the gauge, the wider this non-load-bearing area will be and the more idle sleeper material and ballast will be needed to fill it up. All other factors, such as weight of rail, number of sleepers per kilometre, type of fastenings, thickness of the ballast-bed, the quality of materials used as well as curvature and gradient, are basically independent of gauge. In fact, there appear to be no sound reasons for the old routine of constructing 1 067 mm gauge permanent way to inferior standards.

In South Africa, where there is an intensively used 1 067 mm gauge network of 23 000 km route length, axle-loads of up to 23 tonnes are allowed on mixed traffic mainlines, a figure that is much on par with those practised in Europe or the Soviet Union. Equally in South Africa, the Sishen-Saldanha Bay mineral railway is operated with a normal axle-load of 25 tonnes, allowing 202-wagon trains with a gross trailing load of over 20 000 tonnes, while on the Ermelo-Richard's Bay coal export line profiled wheels will soon permit 26 tonnes per axle without causing undue contactpoint stresses.

Much of this is realised; indeed, the authors of the prospect do state that 'gauge per se does not limit (. . .) axle-load'. What point then can there be in fixing axle-load as a function of gauge?

As for speed, the dynamic behaviour of railway vehicles having the usual solid wheelsets with conical or profiled running surfaces, when compared for different gauges, everything else being the same, probably is a function of the root of the gauge ratio, the inevitable instabilities at critical speeds being supressed by the suspension design.

Whether this is true or perhaps somewhat oversimplified, speeds up to 245 km/h were attained during test runs in South Africa in 1978 and 1979; and it has been announced that these tests will soon be pushed to beyond 300 km/h. Very encouraging results were also obtained on the metre-gauge Abidjan-Niger Railway (RAN) in 1976.

The ultimate speed limits of the railmode, if such limits can at all be defined, are still unknown, but in any event they must be expected to be high; the South African tests suggest that 1 067 mm gauge makes no exception.

Probably very high speeds are judged undesirable on the Queensland and Westrail systems, for operational reasons, but it seems irrational to establish a connection between the relatively low speeds envisaged for these systems and their gauge.

The look upon gauge that is here being criticised, seems to stem from the widespread idea that 'gauge' has something to do with 'size'. Broad gauge is associated with big trains and narrow gauge with small ones. The common usage of terms like 'narrow gauge' and 'standard gauge' aiding, 1 067 mm gauge has acquired a connotation of 'undersized equipment' in Australia.

This mental attitude of attributing to gauge a size meaning goes back to the earliest infancy of the railroads. It is common for vehicles in general to have their wheels fitted perpendicularly beneath their sides, or even somewhat outward, as was the case in the stagecoach, so it is not astonishing at all that the first constructors of railway stock gave their creations this familiar configuration.

This is clearly observed in early locomotives, with their immense single driving wheels, their cylinders constructed between these and well hidden from view, and their curious, bulldog-like broad stance.

Thus during the first two or three decades of railway development, vehicle width and track gauge were indeed closely interrelated and the hypothesis of a relationship between track gauge and line capacity did make sense, at least some sense, hence the policy fashionable at the time to construct broad gauge in industrialised, densely inhabited areas and narrow gauge in remote, sparsely settled country.

Today's locomotives, wagons and coaches, however, resemble the somewhat strange vehicles of the beginning railway era in virtually nothing and their width and height are no longer a function of track gauge.

Indeed, where railways have developed normally (and where such development has not been chronically hindered by gauge controversies!) the vehicles used tend to have a typical width of somewhat less than three metres and a typical height of somewhat less than four metres, regardless of track gauge. As an example, modern rail vehicles in Europe, Southern Africa, East Africa and India are remarkably similar in their chief width and height dimensions, although track gauge is respectively 1 435 mm, 1 067 mm, 1 000 mm and 1 674 mm.

There is nothing paradoxical about this. The common cross-sectional measurements described are the ones that have proven to be the most satisfactory, which means that they represent the dimensional economic optimum for the railmode. This implies that it will be disadvantageous to construct railway stock substantially bigger or substantially smaller. Track gauge, in this connection, appears as almost as irrelevant as the colour of the paint.

Resuming this topic, it may be said that, although track gauge varies considerably from one area to another, vehicle gauge is fairly constant. The two entities just are not interrelated.

In the above the question of gauge has been examined from the triple point of view, be it in a different order, of weight, size and speed, which are the three main parameters governing any mode of transport.

None of these investigations justifies setting the standards for 1 067 mm gauge railways lower than is usual for 1 435 mm and/or 1 600 mm gauge systems. Doing so, insisting upon such a differentiation, means that principles are applied that are now more than a century out of date.

Australia now has some 18,000 kilometres of 1 067 mm gauge route, divided over three different systems. At least one, probably two of these will remain for ever and will have to be run in the most economic manner, as any railway. Any obsolete look upon gauge in general, and its corollary, failure to realise the intrinsical possibilities of 1 067 mm gauge, will, in the economic sense of the term, be penalised sooner or later.

Meanwhile, Sir, I remain, ever interested in Australian railway development, as well as in the articles published in 'Network'.

Sincerely

J. A. VAN DEN BOSCH
Mereveldplein 52,
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Netherlands.

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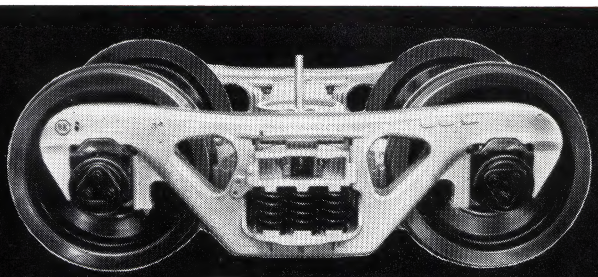

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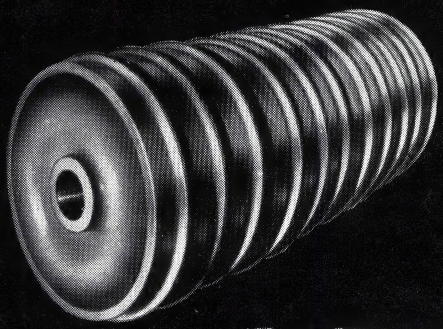

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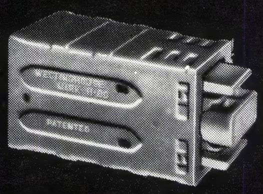

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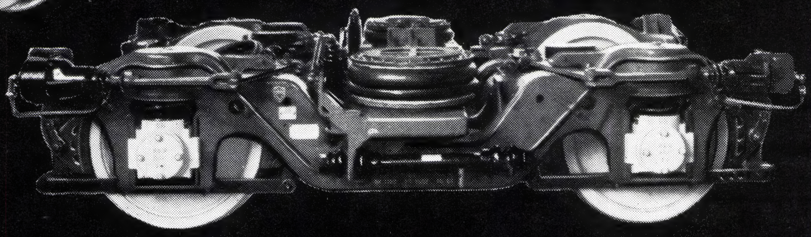

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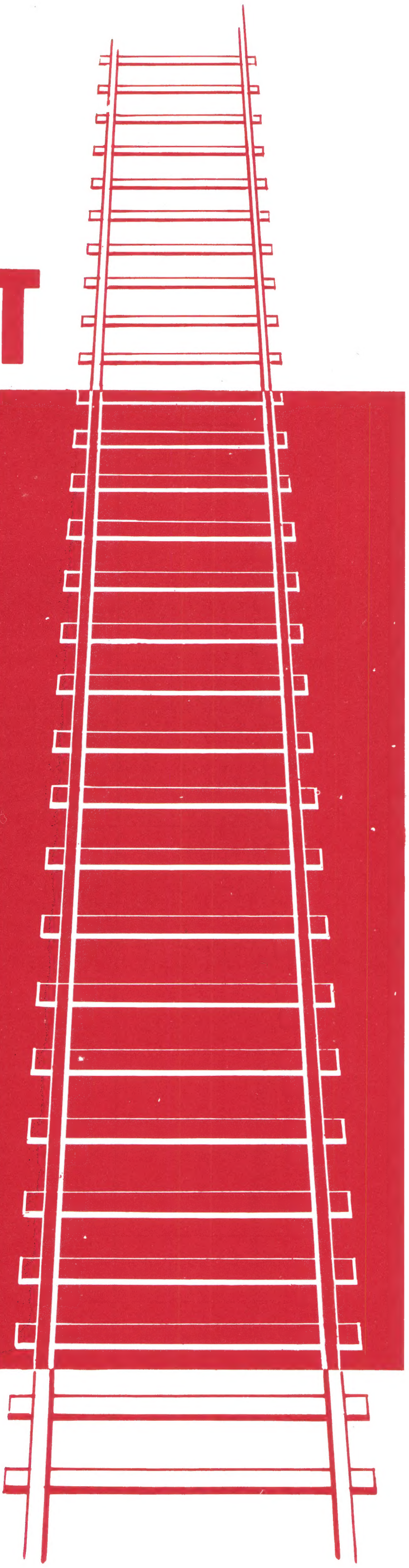

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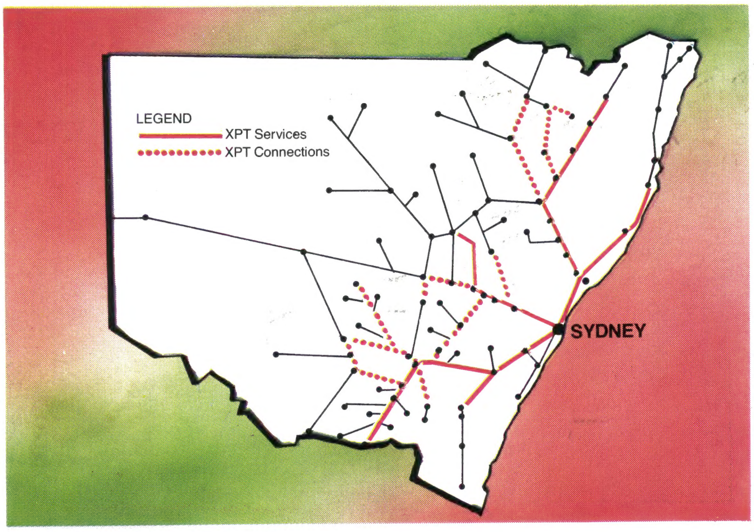

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